Proj. No.: RA 140 DESIGN, BUILD, COMPLETE AND MAINTAIN SHEIKH JABER AL-AHMAD AL-SABAH CAUSEWAY PROJECT (MAIN LINK)	Employer: STATE OF KUWAIT MINISTRY OF PUBLIC WORKS	Request No. RA140-HDC-22-CBR-DRW-0025-03
Engineer's Representative: dar al-handasah shair and partners SSH TYLIN INTERNATIONAL	Contractor: HYUNDAI	Date 13/02/2016

Transmittal of Design Drawing

RECEIVED 28 MAR 2016 HYUNDAI KUSCA

1. Subject Description

Detailed Design - Main Bridge Pile Cap of Pylon Drawing Package

2. Submittal Details

Item Reference	Rev.	Description	Copies
RA140-22-BRG-CW-DW-32250	B4	Detailed Design – Main Bridge Pile Cap Of Pylon Drawing Package	1

RECEIVED 14 FEB 2016 Dar Al Handasah

NOTE
- Including Comment & Response Sheet
- Including SYSTRA & HDEC-CGCC Quality Control & Quality Assurance Checklist

These are transmitted for:

☐ Your information ☑ Approval ☐ Checking ☐ Review and Comment

We certify that the above drawings have been designed by Systra and consented by AECOM

Submitted by : Chan Soo Park / Project Director Signature:

3. Engineer's Approval

~~Refer to our comments on the attached comments and response sheets.~~

☐ Approved ☑ Approved as noted 22/3/16 ☐ Revise and resubmit ☐ Rejected

2016/3/22 Engineer's Signature: Date 28 / 3 / 2016

Approval shall not relieve Contractor of his liabilities under the Contract or constitute authorization of any change to Contract Documents.

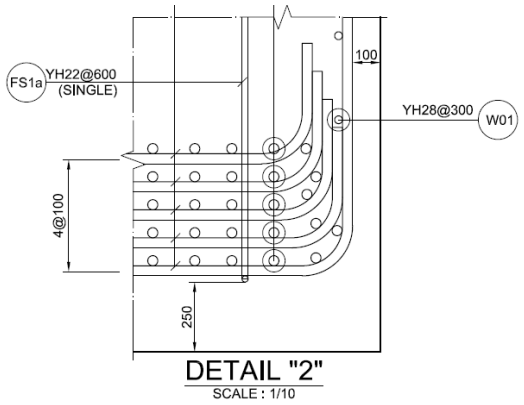
dar al-handasah shair and partners

Comment & Response Sheet Document No: RA140-22-BRG-CW-DW-32250-B4-DR4/C

Ref. Transmittal No : RA140-HDC-22-CBR-DRW-0025-00 (Rev. 00); RA140-HDC-22-CBR-DRW-0025-01 (Rev. 01); RA140-HDC-22-CBR-DRW-0025-02 (Rev. 02); RA140-HDC-22-CBR-DRW-0025-03 (Rev. 03);
Ref. Report No & DWG package No : RA140-22-BRG-CW-DW-32250-B4
Document title : DETAILED DESIGN – MAIN BRIDGE PILE CAP OF PYLON DRAWING PACKAGE
Comments Issued by & date : T.Y. Lin International (Griffith, Rodriguez) on 21 March, 2016
Answer Issued by & date :
Consent Classification : B (A: Consented to, authorized to proceed / B: Consented to, subjected to comments / C: Revise & Resubmit, incorporate comments W: Rejected, not consented to, reason Noted)

No.	Rev.	Reference		Comment rev.[2]	Comment	Response	Cat.[1]	Status[3]
1	A4	32262	Plan View ("3", "4")	1st comment	Layers 3 through 12 need to include a detailed study of the conflict resolution between the bottom mats of steel and the pile bars. Please add additional details.	The bottom mats of steel (Layer 3~12) will be arranged in order to avoid the clash with the pile bars as shown in the drawing, RA140-22-BRG-CW-DW-DW-32278. Please refer to the Appendix #1. Based on the scheme drawing, we will prepare and submit a construction drawing.	2	
				2nd comment	The solution of high precision bending of bars to match an as-built condition in the field seems overly optimistic. It is recommended to provide a solution which has a higher degree of tolerance for field adjustments.	As-built condition in the field must be different with the design, so any solutions at design stage may not satisfy the site condition perfectly. We will process rebars with bending machine on site using actually surveyed results.		BB
	B1			3rd comment	Any significant field modifications to reinforcement steel to resolve conflicts must be reviewed and approved by the Designer for compliance with the design. If modifications result in changes to the design, the changes must also be reviewed and approved by the ICE.	Noted. The change of reinforcement arrangement to resolve conflict or adjust to the field condition, requested by Contractor has been reviewed and approved by Designer and ICE.		BB
				4th comment	Please provide documentation of the reviews by Designer and ICE.			BB

1) Category : Cat 0 = Observation / Note, Cat 1= Information Required Only, Cat 2= Major Comment / Revision Required
2) Comment Rev.: 1st comment, 2nd comment…
3) Comment Status after response: AA = Resolved, implemented and closed, BB = Resolved – not yet implemented, CC = Unresolved

2	A4	32264	Reinforcement Layer	1st comment	The bottom mats of steel will become very congested and difficult to place near the hooks at the perimeter of the pile cap. Consider using headed bars for improved performance or provide detailed conflict resolution showing longitudinal transverse and vertical bars.	The detailed view of the conflict resolution showing longitudinal transverse and vertical bars are provided in DETAIL "2" of DW-32269.  	1	
				2nd comment	The detail is incomplete. The pile cap is circular and as such the transverse bars will not be placed as shown. They will be terminating and bent up along the same face as the longitudinal bars. The resolution must be a 3D solution which resolves conflicts with all the mats of steel.	Please refer to Attachment #1 which is our 3D solution for the hook of bottom reinforcement. This solution will be incorporated in construction drawings.		BB
	B1			3rd comment	3D views are shown at the edges of the pile cap near the longitudinal and transverse axes, however hooks may create an even more congested situation at a 45-degree axis through the pile cap. Consider using headed bars in one direction to ease congestion. Ensure concrete can be placed properly leaving no voids.	This has been developed in shop drawings.		BB
				4th comment	Noted, shop drawings to be verified by site management.			BB

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2) Comment Rev.: 1st comment, 2nd comment…
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3	A4	32268	Section C-C	1st comment	Layers 3 through 12 are not developed at the face of pile. Add hooks or heads.	Hooks will be added to the Layer 8~12 without hooks at the face of the pile as commented. Please refer to the Appendix #2.	2	
				2nd comment	The detail is incomplete. The pile cap is circular and as such the transverse bars will not be placed as shown. They will be terminating and bent up along the same face as the longitudinal bars. The resolution must be a 3D solution which resolves conflicts with all the mats of steel.	Please refer to our answer to comment #2.		CC
	B2			3rd comment	Refer to comment #2.	This has been developed in shop drawings.		AA
4	A4	32276	Section B-B	1st comment	Include a detailed study of the conflict resolution between the bottom mats of tie beam steel and the pile bars. Please add additional details.	Based on the scheme drawing of RA140-22-BRG-CW-DW-DW-32278, we will prepare and submit a construction drawing.	2	
				2nd comment	The solution of high precision bending of bars to match an as-built condition in the field seems overly optimistic. It is recommended to provide a solution which has a higher degree of tolerance for field adjustments.	Please refer to our answer to comment #1.		BB
	B2			3rd comment	Refer to comment #1.	Noted. The change of reinforcement arrangement to resolve conflict or adjust to the field condition, requested by Contractor has been reviewed and approved by Designer and ICE.		AA
5	A4	32282	View-1	1st comment	Top and bottom tie beam bars are not developed beyond the point where they are no longer needed. Please extend the bars farther into the pile cap section.	The top and the bottom beam bars are extended to secure required development length. Please refer to the Attachment #3.	2	
				2nd comment	These bars are very long and will require mechanical couplers. Please revise the drawings to show the location of the	The length of the PT bars which conflict with tie beam bars will be reduced to 9.7m from 10.0m to avoid the rebar crash.		CC

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2) Comment Rev.: 1st comment, 2nd comment…
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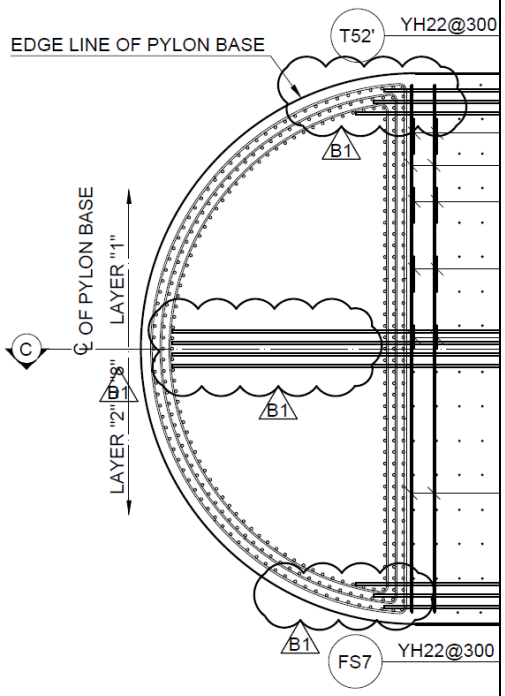
					couplers and the staggering. There are also conflicts apparent between these bars and the PT bars from the back leg anchors. Provide detail of the conflict resolution.	Then, the tie beam bars will not conflict with PT bars from the back leg anchors. The tie beam bars will be extended with lap splices and the locations of lap will be presented in construction drawings.		
	B2			3rd comment	Noted. Please ensure lap splices are staggered.	This has been developed in shop drawings.		BB
				4th comment	Noted, shop drawings to be verified by site management.			BB
6	A3	32288	Section B-B (Layer "1" ~"8" – P3-M Side	1st comment	Provide detail view showing conflict resolution between pylon bars and upper tie beam bars.	The details of the reinforcement interference have been revised. 	2	
				2nd comment	The details in the drawing do not match the details in the response. Please update the cad files for consistency.	Drawing will updated as same as details shown on the previous response which demonstrates that the rebar conflicts can		BB

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					The detail attached in the response shows the bars have been shifted to avoid conflict with the pylon bars but the Attachments to the response indicate the same bars are being shifted to a different configuration and bent to avoid conflict with the pile bars. Please include a complete resolution scheme which addresses both sources of conflict.	be easily resolved. Pile bars will not be extended to that level, so no shift is required to avoid them.		
	B1			3rd comment	Response is noted.			AA
7	A3	32291		1st comment	The reinforcement shown is not consistent with the design calcs which show the upper bars being developed completely into the front and back leg of the pylon. Please extend the bars all the way through the compression block of the pylon front and back legs.	Noted. According to the design calculation, the upper bars are extended into the pylon front and back legs. Please refer to the Attachment #3.	2	
				2nd comment	These bars are very long. Provide details for location and staggering of mechanical couplers.	Please refer to our answer to comment #5.		CC
	B2			3rd comment	Noted. Please ensure lap splices are staggered.	This has been developed in shop drawings.		BB
				4th comment	Noted, shop drawings to be verified by site management.			BB
8	A3	32292	Section D-D	1st comment	Please add a plan view of critical interfaces of vertical and horizontal mats of steel to verify that the bars can be placed consistent with design.	The drawing is about pylon base. The plan view of the circular pilecap reinforcement is provided in DW-32264 and DW- 32265. Please refer to the Attachment #4. The bottom mats of steel (Layer 3~12) will be arranged in order to avoid the clash with the pile bars as shown in the drawing, RA140-22-BRG-CW-DW-DW-32278. Based on the scheme drawing of RA140-22-BRG-CW-DW-DW-32278, we will prepare and submit a construction drawing.	2	

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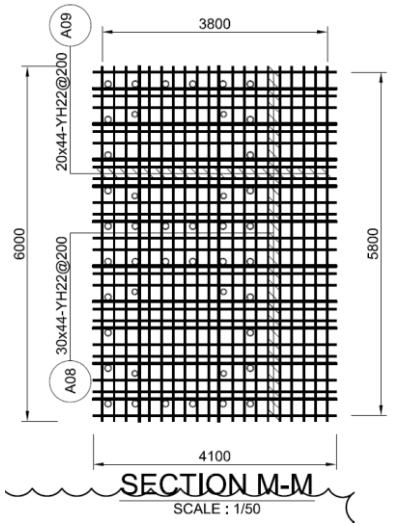
				2nd comment	Response is noted.	Noted.		BB
9	A3	32295	Bursting Reinforcement Detail	1st comment	Provide detailed conflict resolution study for the multiple mats of reinforcement and the PT bars in intersecting orientations.	The PT bars have been rearranged, and the details reflecting conflict resolution have been provided in Section M-M.  	2	
				2nd comment	The conflict between the PT bars appear to be resolved but the new details have introduced numerous additional conflicts between the reinforcement in the anchorage zones. Please provide the resolution concept.	Spirals for individual PT bars will be removed because a large base plate for the group PT bars will be used instead of individual base plate for each PT bar and bursting reinforcement provided can perform the role of the spirals. Rebar conflicts between PT bars and mat reinforcement can be resolved with small adjustment of reinforcement location. Please refer to the Attachment #2 which is BIM study for this area.		CC
	B2			3rd comment	Noted. It is unclear how the PT bars and reinforcement are assembled without conflicts and enabling concrete to be placed without voids. Provide details and method statements.	PT bars will be installed with PT bar frame to set them up at their exact position and then, reinforcement will be assembled to avoid PT bar and PT bar frame later. Shop drawing considering this condition will be submitted before construction.		BB

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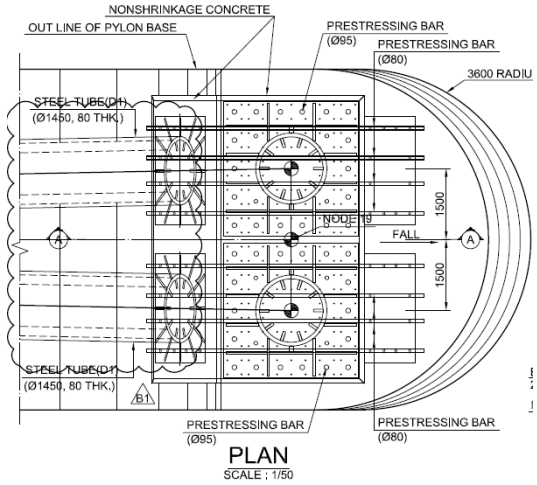
	B4			4th comment	Noted, shop drawings to be verified by site management.			BB
10	A3	32299	Plan	1st comment	Multiple conflicts are shown in PT bars. Please provide detailed conflict resolution drawing including the mild reinforcement in the section showing that it is constructible.	Due to the conflict issue among PT bars, they have been rearranged in square as shown below. In addition, conflict resolution will be taken into account in a construction drawing so as to prevent interference between PT bars and reinforcement. 	2	
				2nd comment	The conflict between the PT bars appear to be resolved but the new details have introduced numerous additional conflicts between the reinforcement in the anchorage zones. Please provide the resolution concept.	Please refer to our answer to comment #9.		CC
	B2			3rd comment	Refer to comment #9	Please refer to our answer to comment #9.		AA
11	A3	32299	Section D-D	1st comment	Please explain the purpose of the rubber ring.	The rubber ring is placed at the nut cap for waterproofing of the PT bars.	1	
				2nd comment	Please verify the rubber ring can carry the prestressing load. The ring appears to be placed between the nut and the	The rubber ring is only a rubber washer which is a component of nut cap. The rubber ring will not carry the prestressing		CC

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					bearing plate which requires all the PT load to be carried through the ring. Provide calculations for the system or a reference to the use of the detail in a code certified application by the supplier. The certifications in the attachments 5 and 6 do not appear to cover these items.	load of PT bar. Please be informed that the details shown on the drawing are indicative. The system details and construction method should be provided by a supplier, but he is not yet decided. Construction of PT bars is scheduled at January 2016 and the method statement including supplier's system details and construction method will be submitted to ER one month or earlier before commencement of construction.		
	B2			3rd comment	Noted, however as shown rubber ring appears to be under the nut in the load path, please clarify. Submit system details and construction method when supplier is selected.	The rubber ring shown on the drawing is indicative only. Selected supplier is Freyssinet and they confirmed that rubber ring wouldn't be required. It will be reflected in the shop drawing.		BB
	B4			4th comment	Noted, shop drawings to be verified by site management.			BB
12	A3	32299	Section D-D	1st comment	Clarify protection for durability of the exposed base plate and PT bars.	For such protection, grouting and nut cap are applied to the PT bars and painting is applied to the base plate.	2	
				2nd comment	Response is noted. Please confirm that the general notes sheets that cover these drawings include the specific materials and coatings for these items or add specific notes to the sheet.	Please be informed that all materials used in the project should be approved by ER before its application. Notes for specific materials and coatings will be added in construction drawing as well as method statement after a system supplier is selected.		BB
	B2			3rd comment	Provide materials and coatings data as well as method statement when system supplier is selected.	Selected supplier is Freyssinet. Please refer to the attached the technical sheet from Freyssinet. Method statement will be submitted soon.		BB
	B4			4th comment	The plans should define the corrosion protection requirements the supplier shall comply with. Please indicate the drawings where corrosion protection is defined in response to this comment.			BB

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13	A3	32299	Section D-D	1st comment	Provide details on how the PT bars are installed and stressed. Provide grout inlet tube and vent tube for the sleeves and system of drainage from the sleeve. Provide specification for filling cement mortar and sleeve.	The PT bars are pre-assembled with temporary fixing structures, inside of the sleeve for grouting. Detailed installation procedure will be included in the corresponding construction method statement. For the filling cement mortar and sleeve, the materials which ER approved for tendon will be used. Please refer to the Attachment #5 and #6.	2	
				2nd comment	The specific installation of these items needs to be included on the drawings to ensure they are correctly placed in the field.	Noted.		BB
	B4			3rd comment	Please update the drawings accordingly and note in response to this comment which drawings include the information requested.			BB
14	A3	32299	Section D-D	1st comment	Please explain the purpose of the bar coupler	Since bar couplers are unnecessary for the PT Bar installation, they have been deleted from the drawing.	1	
				2nd comment	Response is noted.			AA
15	A3	32299	Section A-A	1st comment	How is the bar threaded in the bottom nut after concrete casting? Please clarify.	The PT bars are to be pre-assembled with temporary fixing structures, such as steel frames, to secure precise location of the PT bars during installation and construction. Accordingly, threading of the PT bars is to be done prior to the concrete casting at the factory or site yard. (Detailed installation procedure will be included in the corresponding construction method statement.) Thus, no threading issue into the bottom nut is foreseen.	1	
				2nd comment	Please provide at least a draft version of the method statement which includes the details from comments 9 to 15. The response indicates the PT bars will be	Please refer to our answer to comment #11. For your reference, outline of work sequence of PT bar installation has been		CC

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					tied into the rebar cage inside the ducts during placement of the rebar cage. Provide an estimated duration that the ungrouted bars will be on site inside the ducts where they cannot be inspected or cleaned of rust prior to concrete placement. A comprehensive durability strategy needs to be presented to address both the construction stages as well as service life.	presented in Attachment #3. Regarding durability issue, corrosion protection measure like lamellar zinc coating will be applied to PT bars. In addition, HDPE duct will be sealed with cap or tape as a picture below.  All details for corrosion protection also will be included in the method statement to be submitted later. But, you should note that galvanized PT bars have been used without additional protection in many other projects.		
	B2			3rd comment	Noted. Provide details and method statements.	Please refer to our answer to comment #12. For corrosion protection, epoxy coating instead of galvanizing, cement grouting inside PP duct and sealing cap will be used. Method statement will be submitted soon.		BB
	B4			4th comment	The plans should include the required corrosion protection. Please indicate which plan sheets include this information.			BB
16	B4	32295	Section N-N	1st comment	Please provide dimensions for the proposed hole in the anchor plate.		1	

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2) Comment Rev.: 1st comment, 2nd comment…
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SYSTRA – QUALITY CONTROL & QUALITY ASSURANCE CHECKLIST

Reference	RA140-QFM-06067-2016-02-12-HSH

PACKAGE :	34K	MAIN BRIDGE - SUBSTRUCTURE

Document reference	Revision	Title 1	Title 2	Title 3	Required Action by ER: For Review	For Information	Basic Design Comments Integrated	Detailed Design Comments Integrated	ICE Comment Sheets Included	ICE Reports Included	Status (Consented by ER)
		MAIN BRIDGE	SUBSTRUCTURE								
RA140-22-BRG-CW-TR-32853	B2	MAIN BRIDGE - SUBSTRUCTURE	STEEL-CONCRETE CONNECTION DESIGN AT PYLON BASE	Technical Report	√		√	√	N/A	N/A	
RA140-22-BRG-CW-DW-32250	B4	MAIN BRIDGE - SUBSTRUCTURE	PILE CAP OF PYLON DRAWING PACKAGE	Drawing Package	√		√	√	√ (on A4)	√ (on A4)	√

Reference of ER comments integrated this submission (Comment and Response Sheets Included) :	
	RA140-HDC-22-CBR-TCR-0095-02
	RA140-HDC-22-CBR-DRW-0025-02

Systra hereby certifies that this submission fulfil Systra quality control requirements and procedures :		
	Drawings and reports/calculations have been compared and are consistent	√
	Drawings filled properly	√
	Drawings checked for technical adequacy, legibility, mathematical and drafting accuracy	√
	Drawings are in agreement with other disciplines	√
	Conformance with Design Basis and applicable design specification	√
	Revisions have been clouded	√
	Drawings were properly checked using color codes (Red, Green, Yellow).	√
	Dimensions and units correct and consistent	√

DATE	12/02/2015
NAME	Hyun-Seok Hong
SIGNATURE	

REMARKS	

HDEC & CGCC - Quality Control and Assurance Checklist for RA140 Project

HDEC & CGCC certifies that this submission is properly reviewed by quality control process	SYSTRA QFM are properly filled	√
	Consistency of the drawings and reports	√
	Composition of the document and typographical error are properly reviewed	√
	Drawing list and revision are properly checked	√

	Related Document				
	Document No.	Rev.	Title	Transmittal No.	Submission Date
Completeness of the package	RA140-22-BRG-CW-DW-32250	B4	Detailed Design – Main Bridge Pile Cap Of Pylon Drawing Package	RA140-HDC-22-CBR-DRW-0025-03	14-Feb-16
	RA140-22-BRG-CW-DW-32853	B2	Steel - Concrete Connection Design at Pylon Base P3'-M	RA140-HDC-22-CBR-TCR-0095-04	14-Feb-16

REMARKS	

Date	QC Engineer	Signature
13-Feb-16	YOO DONG YUN	

AECOM

Contract RA-140 - Sheikh Jaber Al-Ahmad Al-Sabah Causeway Project – Main Link

Submission Ref. No.	RA140-TRS-1510	**Title: Main Bridge Pile Cap of Pylon (RA140-22-BRG-CW-DW-32250-A4)**
Response Ref. No.	EKHC:AKML:60290056/8.2-2015005390T	

Response:

No adverse comment	[x]
Agree in Principle with minor Comments	[ ]
Insufficient Information to proceed with Review	[ ]
Major non-conformity found	[ ]

Remarks:

For detail please refer to the attached ICE report.

Exclusion:

- **All construction information such as bar bending schedules, taking off information, locations of couplers/lapping and etc are all excluded in the review.**

From : **AECOM**

Name : **Edward K.H. Chan** **Signature :** **Date :** **22-Jun-15**

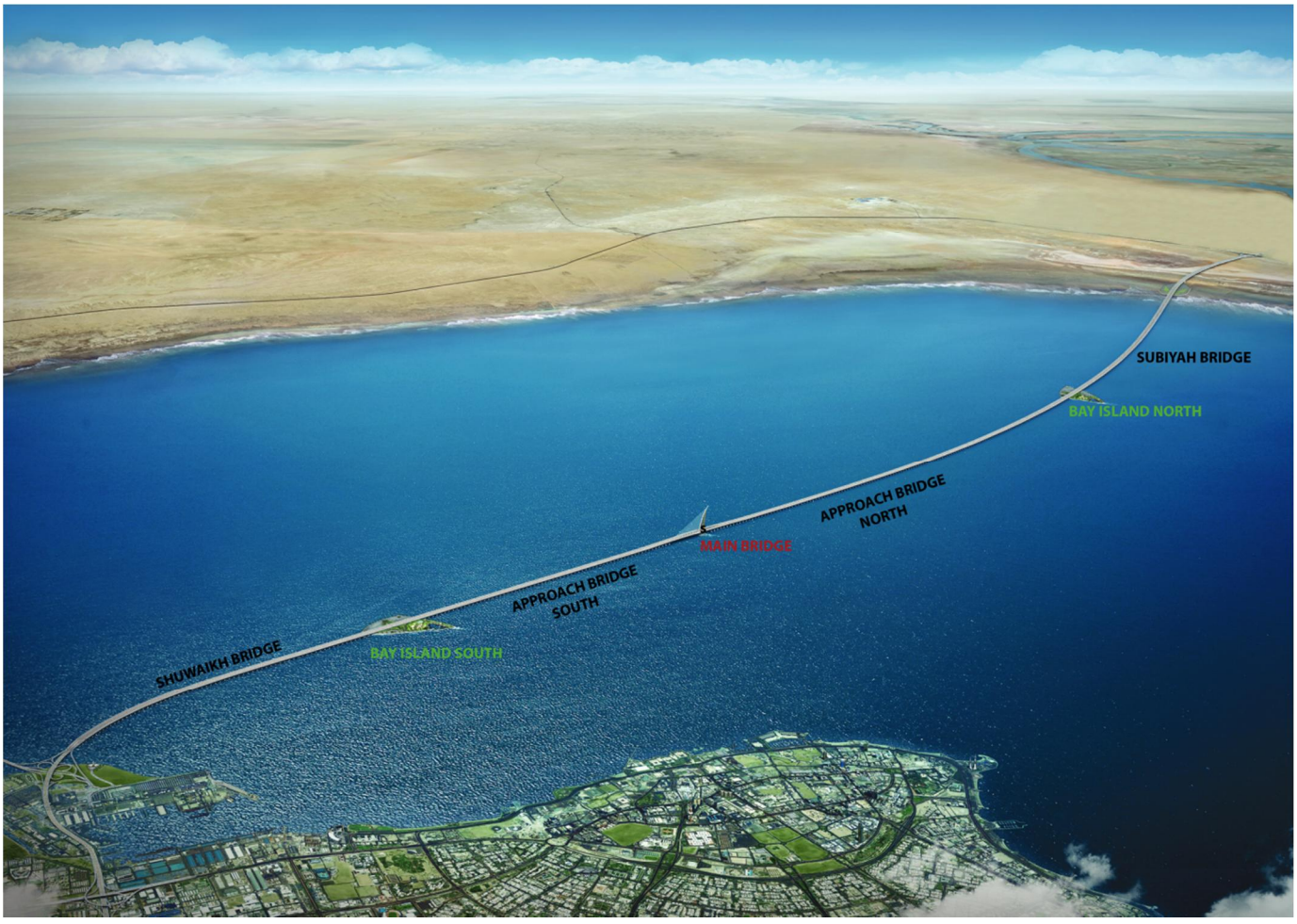
The Design, Build, Completion and Maintain

Sheikh Jaber Al-Ahmad Al-Sabah Causeway Project (Main Link) Contract No. RA140

Kuwait

ICE Check Report for Detailed Design Stage

TRS-1510 Main Bridge Pile Cap of Pylon Drawing Package



HYUNDAI ENGINEERING & CONSTRUCTION

Combined Group Contracting Company

Contents

1. List of Documents Checked

	Transmittal Number/Document No.	Title
Design Package	TRS-1510	Main Bridge Pile Cap of Pylon
Drawings Package	Drawing package No.: RA140-22-BRG-CW-DW-32250-A4	Detailed Design –Main Bridge Pile Cap of Pylon Drawing Package A1

2. Contract Documents used in the Checking

a) Document III.1: General Specifications
- MPW, Roads Administration: General Specifications for Kuwait Motorway/Expressway System, August 2004 and amendments until Tender closing date.
- AASHTO LFRD Bridge Construction Specifications, 2nd Edition 2004, including 2009 Interim Revisions
- General Specifications for Buildings and Engineering Works for Ministry of Public Works year 1990 and amendments until Tender closing date.

b) Document III.2: Particular Specifications Revision 2M

c) Document III.3: Design Criteria Revision 2M

d) Geotechnical Factual Report: Soil Investigation for Port Interchange (PI) Port Bridge (PB) Ghazali Transition (GT)

3. Frozen Scheme Reference in Basic Design Stage

Package/Document No.	Package / Document Title
RA140-22-BRG-CW-DW-32300-A3	Main Bridge Pier
RA140-22-BRG-CW-DW-32250-A4	Main Bridge Pile Cap of Pylon
RA140-10-BRG-CW-TR-00814-B3	Design Basis-Bridge
RA140-10-BRG-CW-TR-00807-A5	Durability Study Plan
RA140-10-BRG-CW-TR-00808-B1	Durability Study

4. Standards and Codes of Practice used in the Checking

AASHTO LRFD Design Specifications SI Units 4th Edition 2007

5. List of Non-Conformance Findings

See Appendix A

Appendix A

List of Non-conformance

ICE Check Report – List of Comments or Non-conformances

Document No : RA140-22-BRG-CW-DW-32250-A4-ICE4IC

Ref.Transmittal No	: TRS-1510
Ref. Report No & DWG package No	: RA140-22-BRG-CW-DW-32250-A4
Document title	: Detailed Design –Main Bridge Pile Cap of Pylon Drawing Package
Comments Issued by & date	: Commented by Guoxiong Yu on 19th May 2015, 2nd comment on 2nd June 2015, 3rd comment on 16nd June 2015, 4th comment on 19nd June 2015
Answer Issued by & date	:
Consent Classification	: A (A: No adverse comments / B: Agree in Principle with minor comments / C: Insufficient Information to proceed with review / W: Major Non-conformity found, revision required)

No.	Rev.	Reference	Comment rev.	Comment or Non-Conformance	Response	Cat.[1]
1	A1	P3-M pile cap Structural nominal resistance of a tension tie (N)	1st	From the STM checking result, it is found that at the bottom of the P3-M pile cap under the Extreme limit state, longitudinal tie-reinforcement of Y36@150mm with 7 layers in the center zone cannot satisfy the nominal resistance of a tension tie (N) according to AASHTO 5.6.3. Tension force = 68799.8 kN > P_r = 66463 MPa ∴ **N.G**	The longitudinal tie reinforcements with 8 layers were arranged in the zone. However, a total of 10 layers of reinforcements (2 layers added) are arranged considering ICE's comment.	2
	A2		2nd	No further comment.	Noted.	A

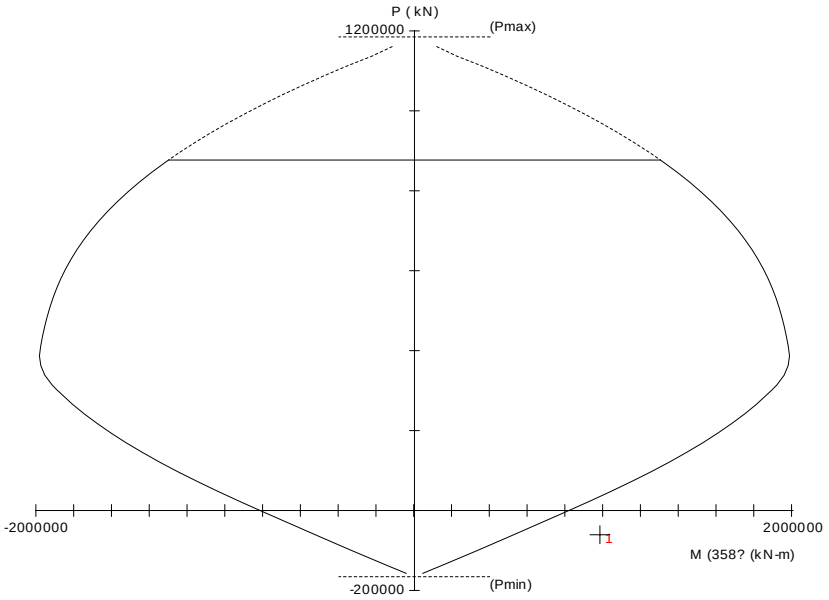
[1)] **Category : Cat A = Agreed with response, Cat 0 = Observation / Note Cat 1 = Minor Comment Cat 2 = Major Comment / To be resolved**
[2)] **Comment Rev. : 1st comment, 2nd comment …**

Verified by: _____

ICE Check Report – List of Comments or Non-conformances

Document No : RA140-22-BRG-CW-DW-32250-A4-ICE4IC

Ref.Transmittal No	: TRS-1510
Ref. Report No & DWG package No	: RA140-22-BRG-CW-DW-32250-A4
Document title	: Detailed Design –Main Bridge Pile Cap of Pylon Drawing Package
Comments Issued by & date	: Commented by Guoxiong Yu on 19th May 2015, 2nd comment on 2nd June 2015, 3rd comment on 16nd June 2015, 4th comment on 19nd June 2015
Answer Issued by & date	:
Consent Classification	: A (A: No adverse comments / B: Agree in Principle with minor comments / C: Insufficient Information to proceed with review / W: Major Non-conformity found, revision required)

No.	Rev.	Reference	Comment rev.	Comment or Non-Conformance	Response	Cat.[1]
2	A1	Tie-beam Structural bending and axial capacity	1st	In the Tie-beam of pylon, summary of the biaxial bending and axial force checking can be shown by the M-N diagrams below, the structural biaxial bending and axial capacity of tie-beam of pylon cannot satisfy requirement under Extreme event state. Please clarify. - Section A-A (case-1 : Extreme Event- Longitudinal Earthquake) : **N.G** 	A total of 8 layers and 5 layers of reinforcements were arranged at the top and the bottom of section A-A, respectively, considering ICE's comment.	2

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ICE Check Report – List of Comments or Non-conformances

Document No : RA140-22-BRG-CW-DW-32250-A4-ICE4IC

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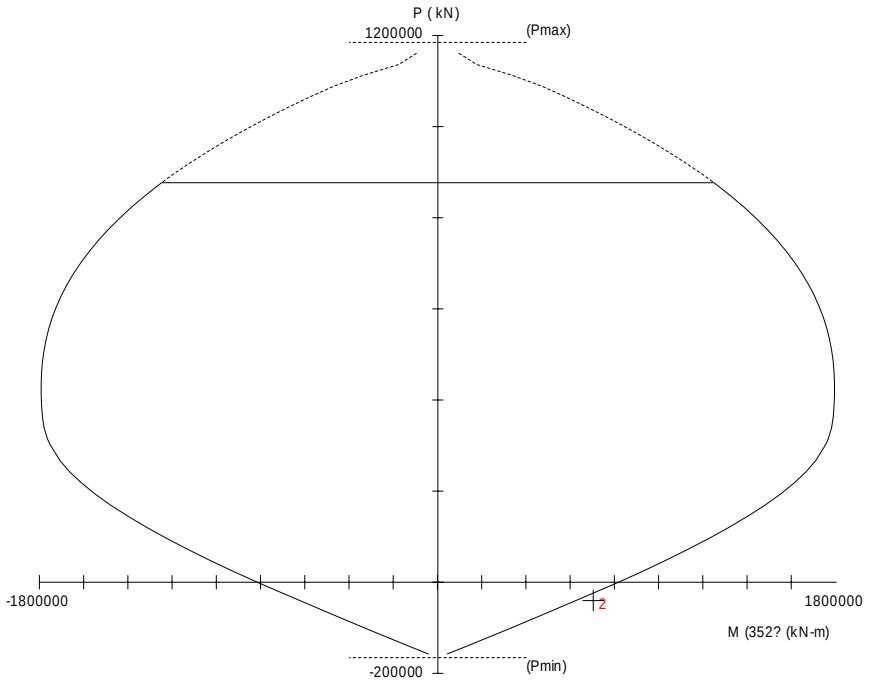
No.	Rev.	Reference	Comment rev.	Comment or Non-Conformance	Response	Cat.[1]
				- Section A-A (case-2 : Extreme Event- Transverse Earthquake) : **N.G**  		2

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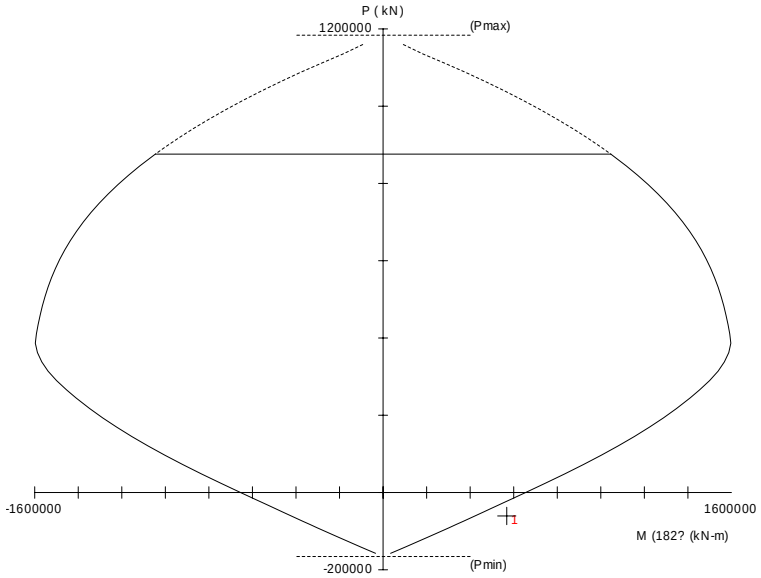
No.	Rev.	Reference	Comment rev.	Comment or Non-Conformance	Response	Cat.[1]
				- Section B-B (case-1 : Extreme Event- Longitudinal Earthquake) : **N.G**  		2
	A2		2nd	No further comment.	Noted.	A

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No.	Rev.	Reference	Comment rev.	Comment or Non-Conformance	Response	Cat.[1]
3	A1	DW-32268 DW-32276 DW-32283	1st	Please provide reinforcement spacing details between layers with cover.	The reinforcement spacing details between layers were provided in DW32269, DW32276, and DW32283, respectively.	2
	A2		2nd	No further comment.	Noted.	A

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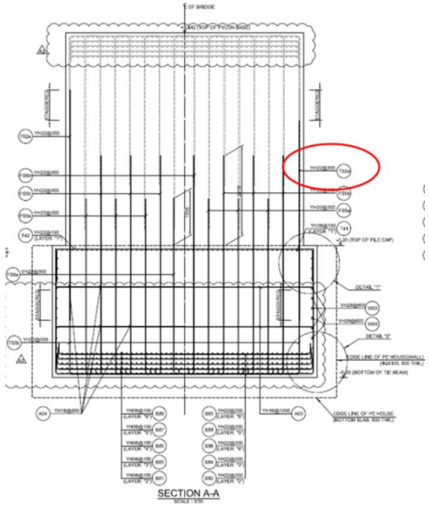
No.	Rev.	Reference	Comment rev.	Comment or Non-Conformance	Response	Cat.[1]
4	A1	DW-32283	1st	The transverse torsion reinforcement shall use closed stirrups to the tie beam according to AASHTO 5.11.2.6.4.	The closed stirrups were arranged as the following figure. Please refer to the rebar no. T52a in drawing, RA140-22-BRG-CW-DW-32283-A2. 	2
	A2		2nd	The transverse torsion reinforcement shall be anchored by 135° standard hook around longitudinal reinforcement according to AASHTO 5.11.2.6.4. Please review.	Noted. The transverse torsion reinforcement was revised to have a 135° standard hook.	2
	A3		3rd	No further comment.	Noted.	A

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No.	Rev.	Reference	Comment rev.	Comment or Non-Conformance	Response	Cat.[1]
5	A2	Tie-beam Torsion capacity	2nd	From the torsion capacity checking, it is found that at the tie-beam under the Extreme limit state, transverse torsion reinforcement of Y22@300mm at the outside of tie-beam cannot satisfy the torsion capacity according to AASHTO 5.8.3.61. spacing 300 mm $A_t = \frac{213{,}527{,}010{,}000 \times s}{2 \times A_0 \times f_y} = \frac{213{,}527{,}010{,}000 \times 300}{2 \times 58{,}437{,}084 \times 550} = 996.5\ mm^2$ Av = YH 22 × 1 ea = 3.871 cm^2 = 387.1 mm^2 N.G	Noted. The transverse torsional reinforcement was changed to YH 32@150.	2
	A3		3rd	No further comment.	Noted.	A
6	A2	Rear base of pylon Structural bending and axial capacity	2nd	In the rear base of pylon (P3-M'), the structural biaxial bending and axial capacity of the section I-I cannot satisfy requirement under Extreme event state (shown by the figure below). Please review.	Noted. The diameter of the longitudinal reinforcement was changed from YH36-3 layers to YH 40-3 layers.	2

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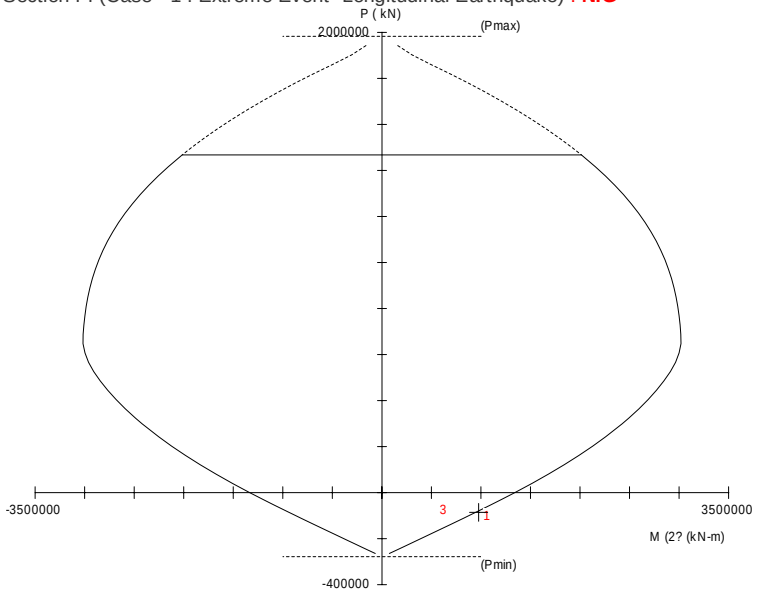
No.	Rev.	Reference		Comment rev.	Comment or Non-Conformance	Response	Cat.[1]
6					- Section I-I (Case - 1 : Extreme Event- Longitudinal Earthquake) : **N.G** 		2
	A3			3rd	No further comment.	Noted.	A

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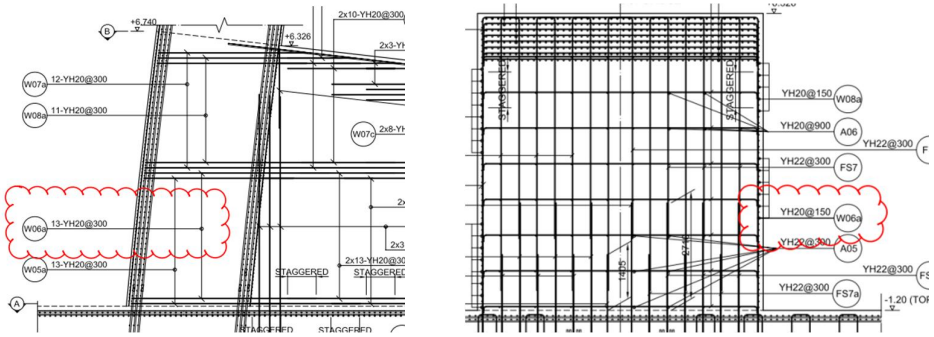
No.	Rev.	Reference	Comment rev.	Comment or Non-Conformance	Response	Cat.[1]
7	A2	Rear base of pylon Vertical Bearing capacity	2nd	Jacking force of pre-stressing bars in the rear base of pylon has not been given in the drawings, please provide.	The jacking force of pre-stressing bars is 0.7Fpu.	2
	A3		3rd	Please specify this jacking force of pre-stressing bars in drawings.	The jacking force of prestressing bar with dia. 85 mm and dia. 41 mm are 4696 kN and 1096 kN, respectively.	2
	A4		4th	No further comment.		A
8	A2	DW-32285 & DW-32292	2nd	The spacing of W06a reinforcements are different between DW-32285 and DW-32292. Please clarify. 	It is a typo. The spacing of W06a reinforcement is revised to 300mm.	2
	A3		3rd	No further comment.	Noted.	A

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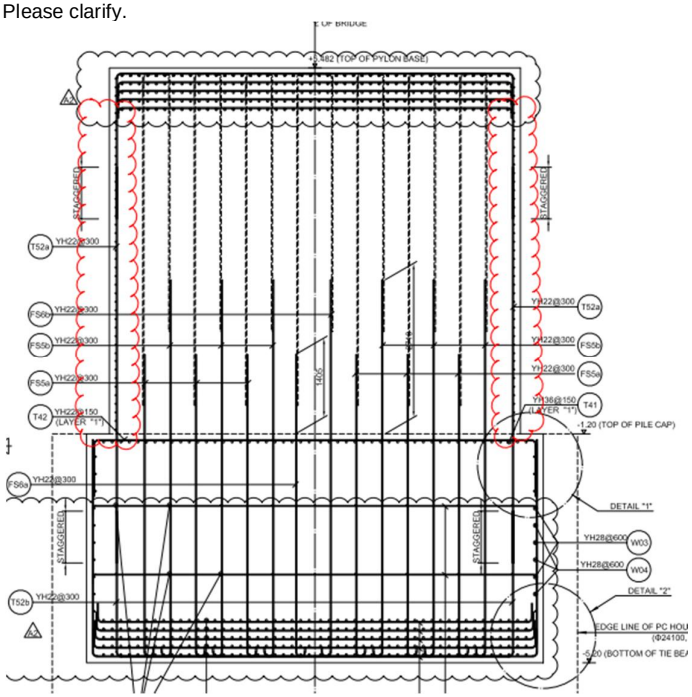
No.	Rev.	Reference	Comment rev.	Comment or Non-Conformance	Response	Cat.[1]
9	A2	DW-32283	2nd	Torsion reinforcement (T52a, shown in the figure below) shall be arranged inside the longitudinal reinforcements, Please clarify. 	Noted. The inside reinforcement at the bottom tension reinforcement was included for the calculation of torsion reinforcement. . And the bottom tension reinforcement was changed from 5-layer to 6-layer.	2
	A3		3rd	No further comment.	Noted.	A

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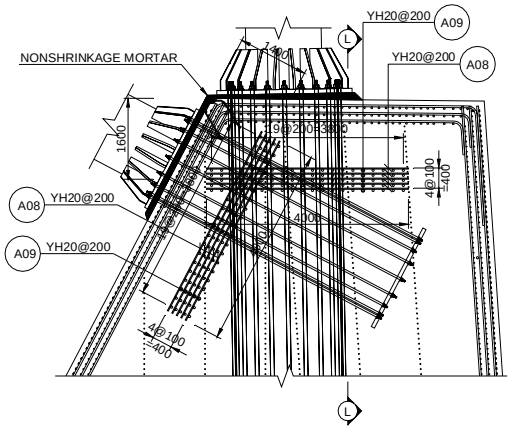
No.	Rev.	Reference	Comment rev.	Comment or Non-Conformance	Response	Cat.[1]
10	A2	Rear base of pylon	2nd	The reinforcements such as bursting reinforcement in the anchorage zone of the prestressing bars shall be provided.	Noted. The bursting reinforcements were added. Please find the drawing, RA140-22-BRG-CW-DW-32295. 	2

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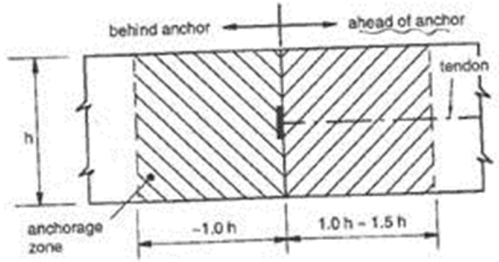
No.	Rev.	Reference		Comment rev.	Comment or Non-Conformance	Response	Cat.[1]
	A3			3rd	The tie-back reinforcement in intermediate anchorages shall be applied according to AASHTO 5.10.9.4.4b.  c) Intermediate Anchor Fig. VIII-14 Examples of General Zone Dimensions	Noted. The reinforcement number, A21~A28 added around the intermediate anchorages in DW-32295.	2
	A4			4th	The tie-back reinforcements have been added in DW-32295. No further comment.		A
11	A3	DW-32298		3rd	This drawing is concrete pylon leg portion, which is not relevant to pile cap, please remove it from pile cap drawing package.	Noted. The drawing, DW-32298 was shifted into the pylon concrete leg drawing package, RA140-22-BRG-CW-DW-32500.	2
	A4			4th	No further comment.		A

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STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

وزارة الأشغال العامة
MINISTRY OF PUBLIC WORKS

Sheikh Jaber Al-Ahmad Al-Sabah Causeway Project

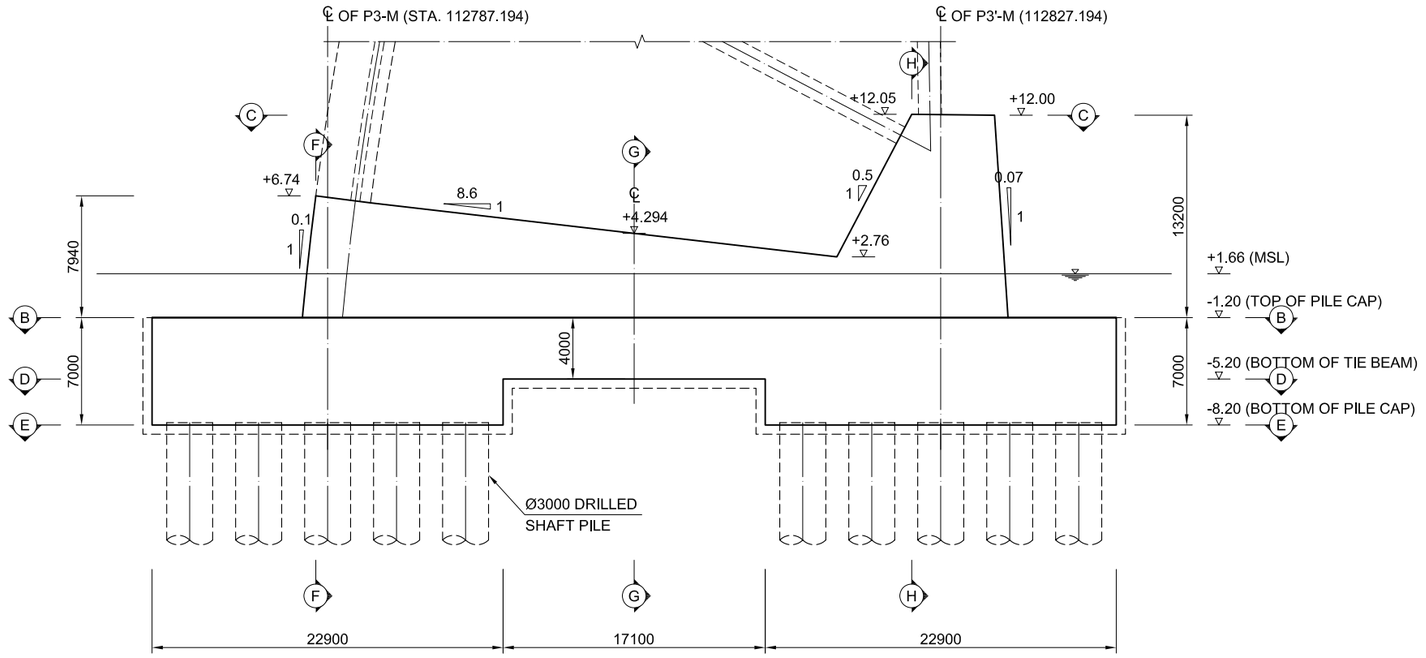
Main Link – Contract RA/140

DETAILED DESIGN –MAIN BRIDGE
PILE CAP OF PYLON DRAWING PACKAGE

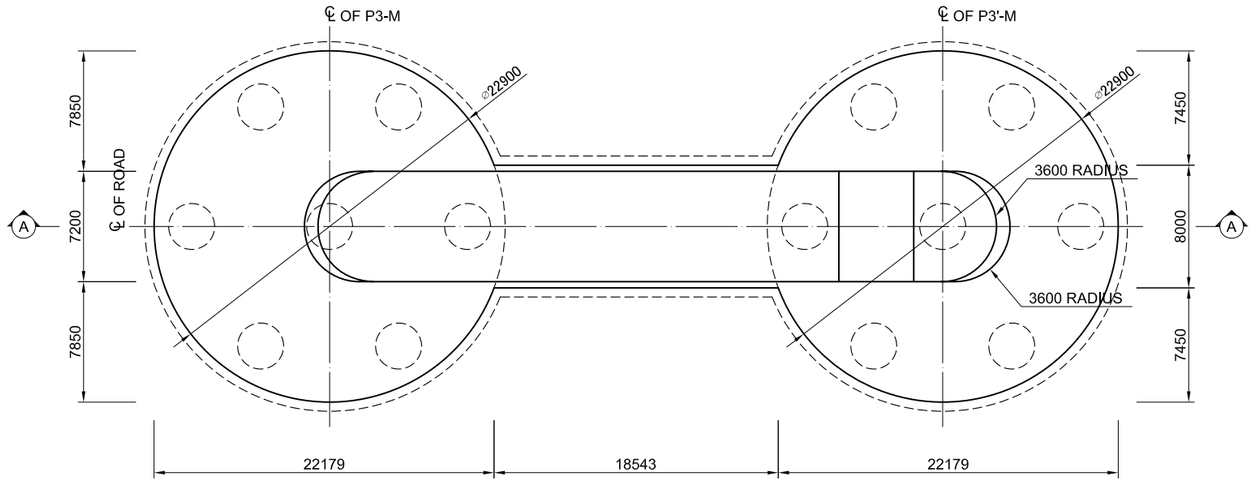
Drawing package No.: RA140-22-BRG-CW-DW-32250-B4

Code	Revision	Date	Title 1	Title 2	Title 3	Comment
RA140-22-BRG-CW-DW-32251	A3	17/06/2015	MAIN BRIDGE	PILE CAP OF PYLON	GENERAL LAYOUT 1/4	
RA140-22-BRG-CW-DW-32252	A3	17/06/2015	MAIN BRIDGE	PILE CAP OF PYLON	GENERAL LAYOUT 2/4	
RA140-22-BRG-CW-DW-32253	A3	17/06/2015	MAIN BRIDGE	PILE CAP OF PYLON	GENERAL LAYOUT 3/4	
RA140-22-BRG-CW-DW-32254	A3	17/06/2015	MAIN BRIDGE	PILE CAP OF PYLON	GENERAL LAYOUT 4/4	
RA140-22-BRG-CW-DW-32255	B2	10/09/2015	MAIN BRIDGE	PILE CAP OF PYLON (P3-M, P3'-M)	STAINLESS STEEL ARRANGEMENT 1/4	
RA140-22-BRG-CW-DW-32256	B2	10/09/2015	MAIN BRIDGE	PILE CAP OF PYLON (P3-M, P3'-M)	STAINLESS STEEL ARRANGEMENT 2/4	
RA140-22-BRG-CW-DW-32257	B1	12/08/2015	MAIN BRIDGE	PILE CAP OF PYLON (P3-M, P3'-M)	STAINLESS STEEL ARRANGEMENT 3/4	
RA140-22-BRG-CW-DW-32258	B1	12/08/2015	MAIN BRIDGE	PILE CAP OF PYLON (P3-M, P3'-M)	STAINLESS STEEL ARRANGEMENT 4/4	
RA140-22-BRG-CW-BS-32259	B1	12/08/2015	MAIN BRIDGE	PILE CAP OF PYLON (P3-M, P3'-M)	STAINLESS STEEL BAR LIST	
RA140-22-BRG-CW-DW-32261	B1	10/09/2015	MAIN BRIDGE	PILE CAP OF PYLON (P3-M)	REINFORCEMENT ARRANGEMENT 1/9	
RA140-22-BRG-CW-DW-32262	B1	10/09/2015	MAIN BRIDGE	PILE CAP OF PYLON (P3-M)	REINFORCEMENT ARRANGEMENT 2/9	
RA140-22-BRG-CW-DW-32263	B1	10/09/2015	MAIN BRIDGE	PILE CAP OF PYLON (P3-M)	REINFORCEMENT ARRANGEMENT 3/9	
RA140-22-BRG-CW-DW-32264	B1	10/09/2015	MAIN BRIDGE	PILE CAP OF PYLON (P3-M)	REINFORCEMENT ARRANGEMENT 4/9	
RA140-22-BRG-CW-DW-32265	B1	10/09/2015	MAIN BRIDGE	PILE CAP OF PYLON (P3-M)	REINFORCEMENT ARRANGEMENT 5/9	
RA140-22-BRG-CW-DW-32266	B2	10/09/2015	MAIN BRIDGE	PILE CAP OF PYLON (P3-M)	REINFORCEMENT ARRANGEMENT 6/9	
RA140-22-BRG-CW-DW-32267	B2	10/09/2015	MAIN BRIDGE	PILE CAP OF PYLON (P3-M)	REINFORCEMENT ARRANGEMENT 7/9	
RA140-22-BRG-CW-DW-32268	B2	10/09/2015	MAIN BRIDGE	PILE CAP OF PYLON (P3-M)	REINFORCEMENT ARRANGEMENT 8/9	
RA140-22-BRG-CW-DW-32269	B1	10/09/2015	MAIN BRIDGE	PILE CAP OF PYLON (P3-M)	REINFORCEMENT ARRANGEMENT 9/9	
RA140-22-BRG-CW-BS-32270	B2	10/09/2015	MAIN BRIDGE	PILE CAP OF PYLON (P3-M)	BAR LIST	
RA140-22-BRG-CW-DW-32271	B2	10/09/2015	MAIN BRIDGE	PILE CAP OF PYLON (P3'-M)	REINFORCEMENT ARRANGEMENT 1/7	
RA140-22-BRG-CW-DW-32272	B2	10/09/2015	MAIN BRIDGE	PILE CAP OF PYLON (P3'-M)	REINFORCEMENT ARRANGEMENT 2/7	

RA140-22-BRG-CW-DW-32273	B2	10/09/2015	MAIN BRIDGE	PILE CAP OF PYLON (P3'-M)	REINFORCEMENT ARRANGEMENT 3/7	
RA140-22-BRG-CW-DW-32274	B2	10/09/2015	MAIN BRIDGE	PILE CAP OF PYLON (P3'-M)	REINFORCEMENT ARRANGEMENT 4/7	
RA140-22-BRG-CW-DW-32279	B1	10/09/2015	MAIN BRIDGE	PILE CAP OF PYLON (P3'-M)	REINFORCEMENT ARRANGEMENT 5/7	
RA140-22-BRG-CW-DW-32275	B2	10/09/2015	MAIN BRIDGE	PILE CAP OF PYLON (P3'-M)	REINFORCEMENT ARRANGEMENT 6/7	
RA140-22-BRG-CW-DW-32276	B2	10/09/2015	MAIN BRIDGE	PILE CAP OF PYLON (P3'-M)	REINFORCEMENT ARRANGEMENT 7/7	
RA140-22-BRG-CW-BS-32277	B2	10/09/2015	MAIN BRIDGE	PILE CAP OF PYLON (P3'-M)	BAR LIST	
RA140-22-BRG-CW-DW-32278	B1	12/08/2015	MAIN BRIDGE	PILE CAP OF PYLON	SCHEME FOR AVOIDING REBAR CONFLIC	
RA140-22-BRG-CW-DW-32281	B2	10/09/2015	MAIN BRIDGE	PILE CAP OF PYLON (TIE BEAM)	REINFORCEMENT ARRANGEMENT 1/3	
RA140-22-BRG-CW-DW-32282	B2	10/09/2015	MAIN BRIDGE	PILE CAP OF PYLON (TIE BEAM)	REINFORCEMENT ARRANGEMENT 2/3	
RA140-22-BRG-CW-DW-32283	A5	20/07/2015	MAIN BRIDGE	PILE CAP OF PYLON (TIE BEAM)	REINFORCEMENT ARRANGEMENT 3/3	
RA140-22-BRG-CW-BS-32284	B2	10/09/2015	MAIN BRIDGE	PILE CAP OF PYLON (TIE BEAM)	BAR LIST	
RA140-22-BRG-CW-DW-32285	B2	10/09/2015	MAIN BRIDGE	PILE CAP OF PYLON (PYLON BASE)	REINFORCEMENT ARRANGEMENT 1/11	
RA140-22-BRG-CW-DW-32286	B2	10/09/2015	MAIN BRIDGE	PILE CAP OF PYLON (PYLON BASE)	REINFORCEMENT ARRANGEMENT 2/11	
RA140-22-BRG-CW-DW-32287	B1	12/08/2015	MAIN BRIDGE	PILE CAP OF PYLON (PYLON BASE)	REINFORCEMENT ARRANGEMENT 3/11	
RA140-22-BRG-CW-DW-32288	B1	12/08/2015	MAIN BRIDGE	PILE CAP OF PYLON (PYLON BASE)	REINFORCEMENT ARRANGEMENT 4/11	
RA140-22-BRG-CW-DW-32289	B1	12/08/2015	MAIN BRIDGE	PILE CAP OF PYLON (PYLON BASE)	REINFORCEMENT ARRANGEMENT 5/11	
RA140-22-BRG-CW-DW-32290	B2	10/09/2015	MAIN BRIDGE	PILE CAP OF PYLON (PYLON BASE)	REINFORCEMENT ARRANGEMENT 6/11	
RA140-22-BRG-CW-DW-32291	B2	10/09/2015	MAIN BRIDGE	PILE CAP OF PYLON (PYLON BASE)	REINFORCEMENT ARRANGEMENT 7/11	
RA140-22-BRG-CW-DW-32292	B2	10/09/2015	MAIN BRIDGE	PILE CAP OF PYLON (PYLON BASE)	REINFORCEMENT ARRANGEMENT 8/11	
RA140-22-BRG-CW-DW-32293	B2	10/09/2015	MAIN BRIDGE	PILE CAP OF PYLON (PYLON BASE)	REINFORCEMENT ARRANGEMENT 9/11	
RA140-22-BRG-CW-DW-32294	B1	12/08/2015	MAIN BRIDGE	PILE CAP OF PYLON (PYLON BASE)	REINFORCEMENT ARRANGEMENT 10/11	
RA140-22-BRG-CW-DW-32295	B4	12/02/2016	MAIN BRIDGE	PILE CAP OF PYLON (PYLON BASE)	REINFORCEMENT ARRANGEMENT 11/11	
RA140-22-BRG-CW-DW-32296	B2	04/12/2015	MAIN BRIDGE	PILE CAP OF PYLON (PYLON BASE)	BAR LIST 1/2	
RA140-22-BRG-CW-DW-32297	B4	12/02/2016	MAIN BRIDGE	PILE CAP OF PYLON (PYLON BASE)	BAR LIST 2/2	
RA140-22-BRG-CW-DW-32299	B4	12/02/2016	MAIN BRIDGE	PILE CAP OF PYLON	ANCHORAGE DETAILS	



FRONT VIEW
SCALE : 1/200



PLAN VIEW
SCALE : 1/200

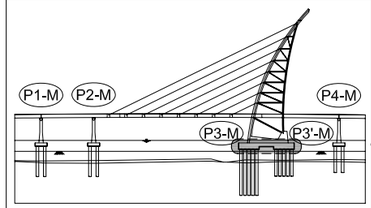
NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
   -PYLON PILE CAP : 40MPa
   -PYLON BASE : 50MPa
3. REINFORCEMENT REBARS SHALL CONFORM TO ASTM A706 GRADE 80(550 MPa) FOR CARBON REBARS(YH).
4. THE STAINLESS STEEL REINFORCEMENT IS RIBBED BARS.
5. FOR SECTION A-A REFER TO DRAWING NO.RA140-22-BRG-CW-DW-32252.
6. FOR SECTION B-B,C-C REFER TO DRAWING NO.RA140-22-BRG-CW-DW-32253.
7. FOR SECTION D-D,E-E,F-F,G-G,H-H REFER TO DRAWING NO.RA140-22-BRG-CW-DW-32254.

STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).



REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
A3	17/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A2	05/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	08/04/15	First Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON
GENERAL LAYOUT 1/4

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED				
08/04/15	08/04/15	08/04/15	08/04/15	08/04/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

DESIGNER

SYSTRA

DRAWING NO. RA140-22-BRG-CW-DW-32251

REV. A3

A1(594x841mm +2mm)

(KUWAIT CITY) (SUBIYAH)

9807 | 870 | 12223 | 8550 | 8550 | 4676 | 4878 | 5402 | 881 | 7063

℄ OF P3-M (STA. 112787.194)

℄ OF P3'-M (112827.194)

+12.05

+12.00

+6.74

EDGE LINE OF PYLON BASE

+5.282

+4.294

+3.305

+2.76

+1.66 (MSL)

-1.20 (TOP OF PILE CAP)

-5.20 (BOTTOM OF TIE BEAM)

-8.20 (BOTTOM OF PILE CAP)

7940

6482

5494

46030

4505

3964

9291

13200

9807

7063

4000

3000

EDGE LINE OF PILE CAP

EDGE LINE OF PC HOUSE
600 THK.

Ø3000 DRILLED
SHAFT PILE

22900 | 17100 | 22900

SECTION A-A
SCALE : 1/100

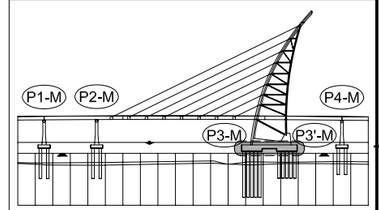
NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
   -PYLON PILE CAP : 40MPa
   -PYLON BASE : 50MPa
3. REINFORCEMENT REBARS SHALL CONFORM TO ASTM A706 GRADE 80(550 MPa) FOR CARBON REBARS(YH).
4. THE STAINLESS STEEL REINFORCEMENT IS RIBBED BARS.
5. FOR SECTION A-A REFER TO DRAWING NO.RA140-22-BRG-CW-DW-32251.

STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).



REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
A3	17/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A2	05/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	08/04/15	First Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON
GENERAL LAYOUT 2/4

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED				
08/04/15	08/04/15	08/04/15	08/04/15	08/04/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

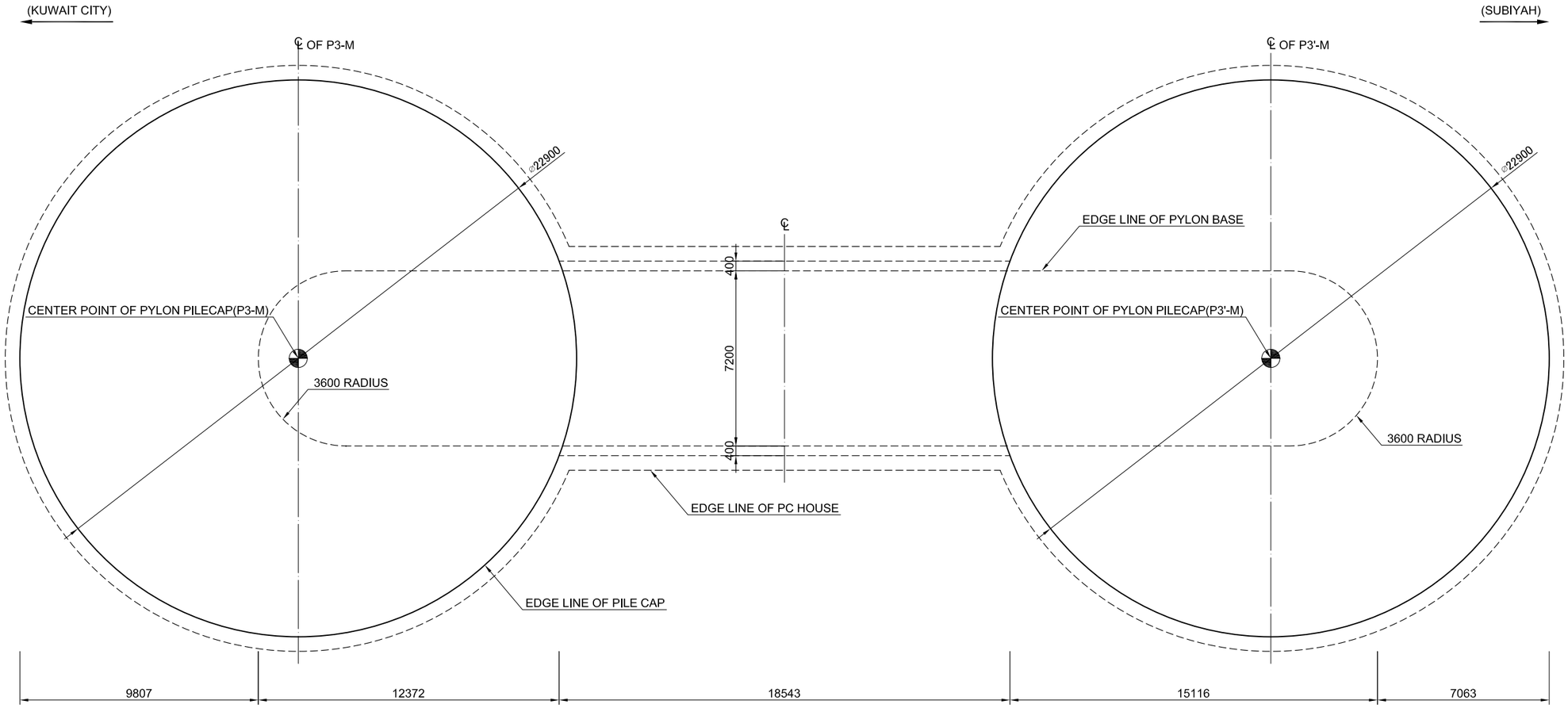
DESIGNER

SYSTRA

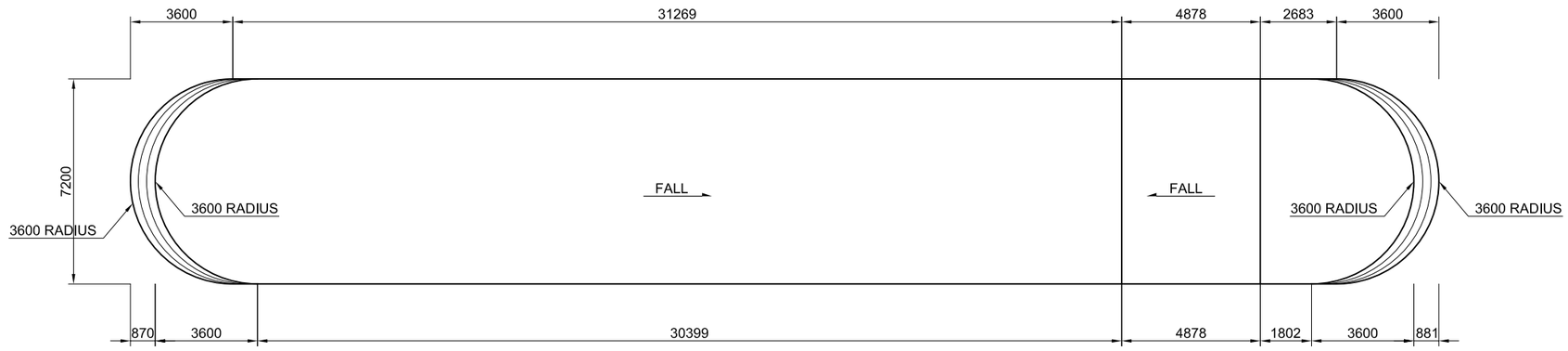
DRAWING NO. RA140-22-BRG-CW-DW-32252

REV. A3

A1(594x841mm +2mm)



SECTION B-B
SCALE : 1/100



SECTION C-C (PLAN VIEW)
SCALE : 1/100

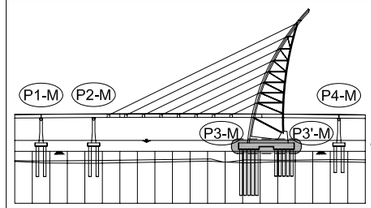
NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
   -PYLON PILE CAP : 40MPa
   -PYLON BASE : 50MPa
3. REINFORCEMENT REBARS SHALL CONFORM TO ASTM A706 GRADE 80(550 MPa) FOR CARBON REBARS(YH).
4. THE STAINLESS STEEL REINFORCEMENT IS RIBBED BARS.
5. FOR SECTION B-B, C-C REFER TO DRAWING NO.RA140-22-BRG-CW-DW-32251.

STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).



REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
A3	17/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A2	05/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	08/04/15	First Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON
GENERAL LAYOUT 3/4

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED				
08/04/15	08/04/15	08/04/15	08/04/15	08/04/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

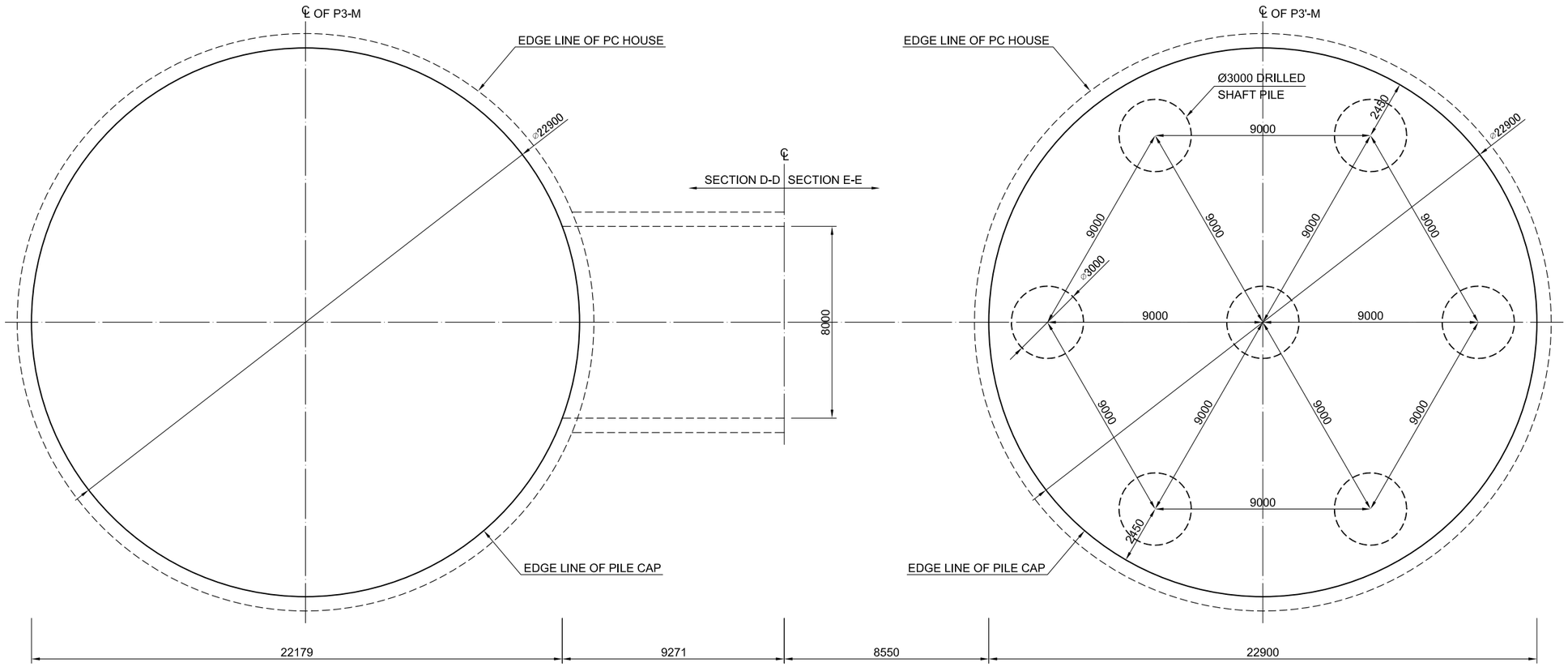
DESIGNER

SYSTRA

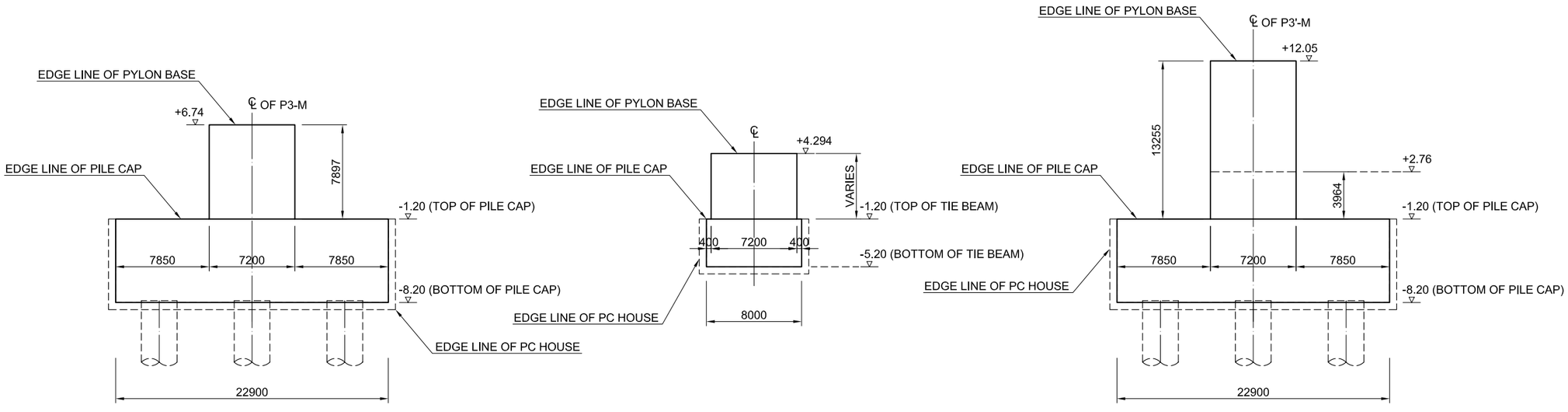
DRAWING NO. RA140-22-BRG-CW-DW-32253

REV. A3

A1(594x841mm ±2mm)



SECTION D-D, E-E
SCALE : 1/100



SECTION F-F
SCALE : 1/200

SECTION G-G
SCALE : 1/200

SECTION H-H
SCALE : 1/200

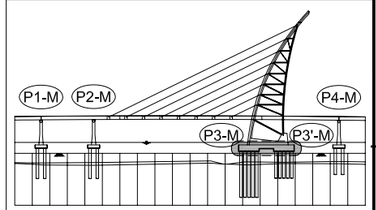
NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
   -PYLON PILE CAP : 40MPa
   -PYLON BASE : 50MPa
3. REINFORCEMENT REBARS SHALL CONFORM TO ASTM A706 GRADE 80(550 MPa) FOR CARBON REBARS(YH).
4. THE STAINLESS STEEL REINFORCEMENT IS RIBBED BARS.
5. FOR SECTION D-D,E-E,F-F,G-G AND H-H REFER TO DRAWING NO.RA140-22-BRG-CW-DW-32251.

STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).



REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
A3	17/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A2	05/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	08/04/15	First Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON
GENERAL LAYOUT 4/4

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED				
08/04/15	08/04/15	08/04/15	08/04/15	08/04/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

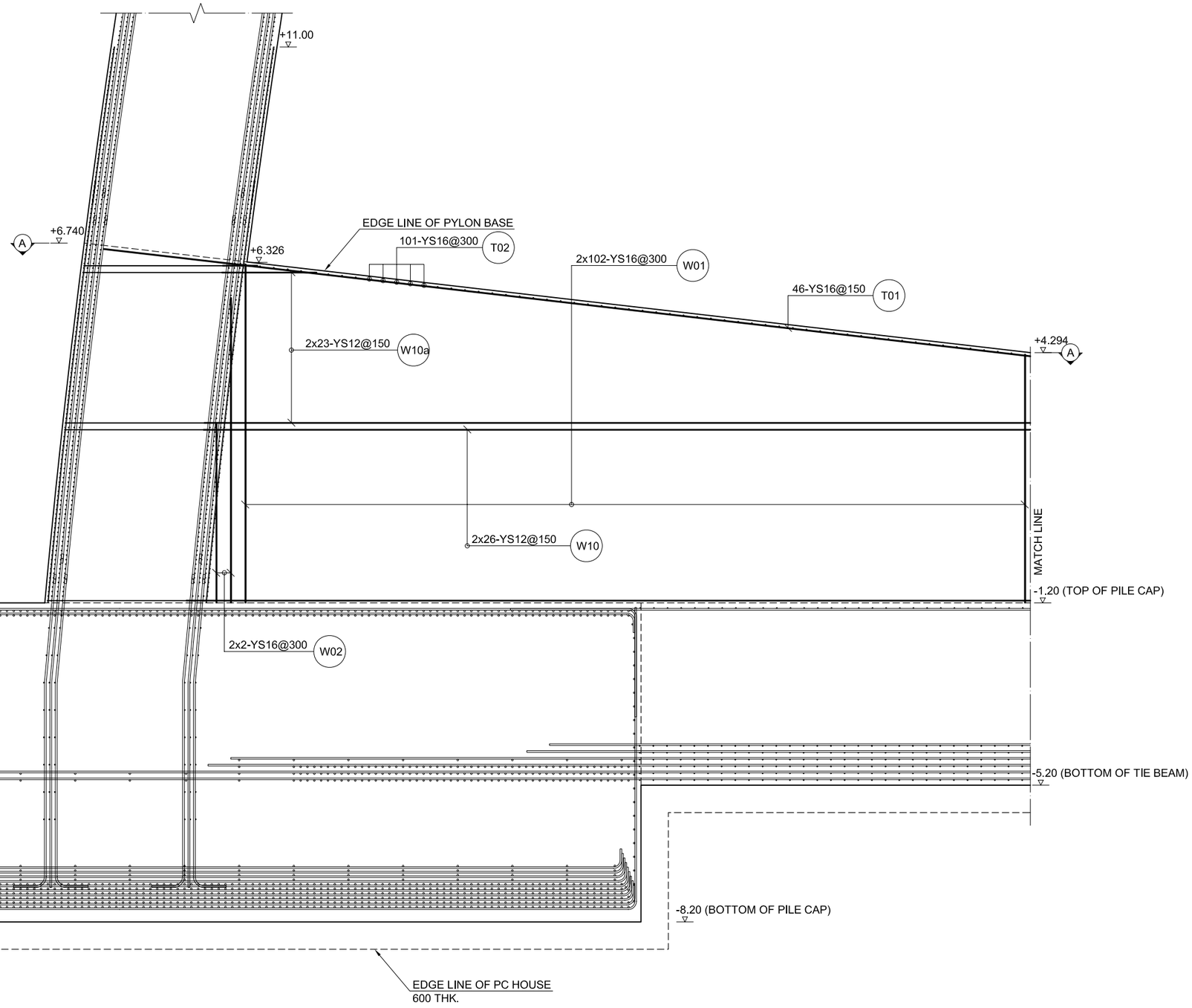
DESIGNER

SYSTRA

DRAWING NO. RA140-22-BRG-CW-DW-32254

REV. A3

A1(594x841mm +2mm)

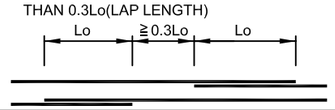


ELEVATION VIEW OF PYLON BASE 1/2 (P3-M SIDE)

SCALE : 1/50

NOTES:

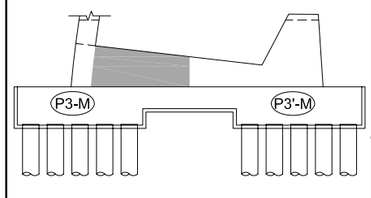
1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
   -PYLON PILE CAP : 40MPa
   -PYLON BASE : 50MPa
3. REINFORCEMENT REBARS SHALL CONFORM TO ASTM A706 GRADE 80(550 MPa) FOR CARBON REBARS(YH).
4. THE STAINLESS STEEL REINFORCEMENT IS RIBBED BARS.
5. MINIMUM CONRETE COVER TO REINFORCEMENT SHALL BE 100mm.
6. FOR SECTION A-A REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32257.
7. THE LONGITUDINAL DISTANCE BETWEEN TWO ADJACENT LAPS SHOULD NOT BE LESS THAN 0.3Lo(LAP LENGTH)



STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).



REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B2	10/09/15	Updated As Shown In Clouds	SWK	HSH	DKK
B1	12/08/15	Updated As Shown In Clouds	SWK	HSH	DKK
A3	17/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	17/05/15	FIrst Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (P3-M, P3'-M)
STAINLESS STEEL ARRANGEMENT 1/4

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED				
17/05/15	17/05/15	17/05/15	17/05/15	17/05/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

DESIGNER

SYSTRA

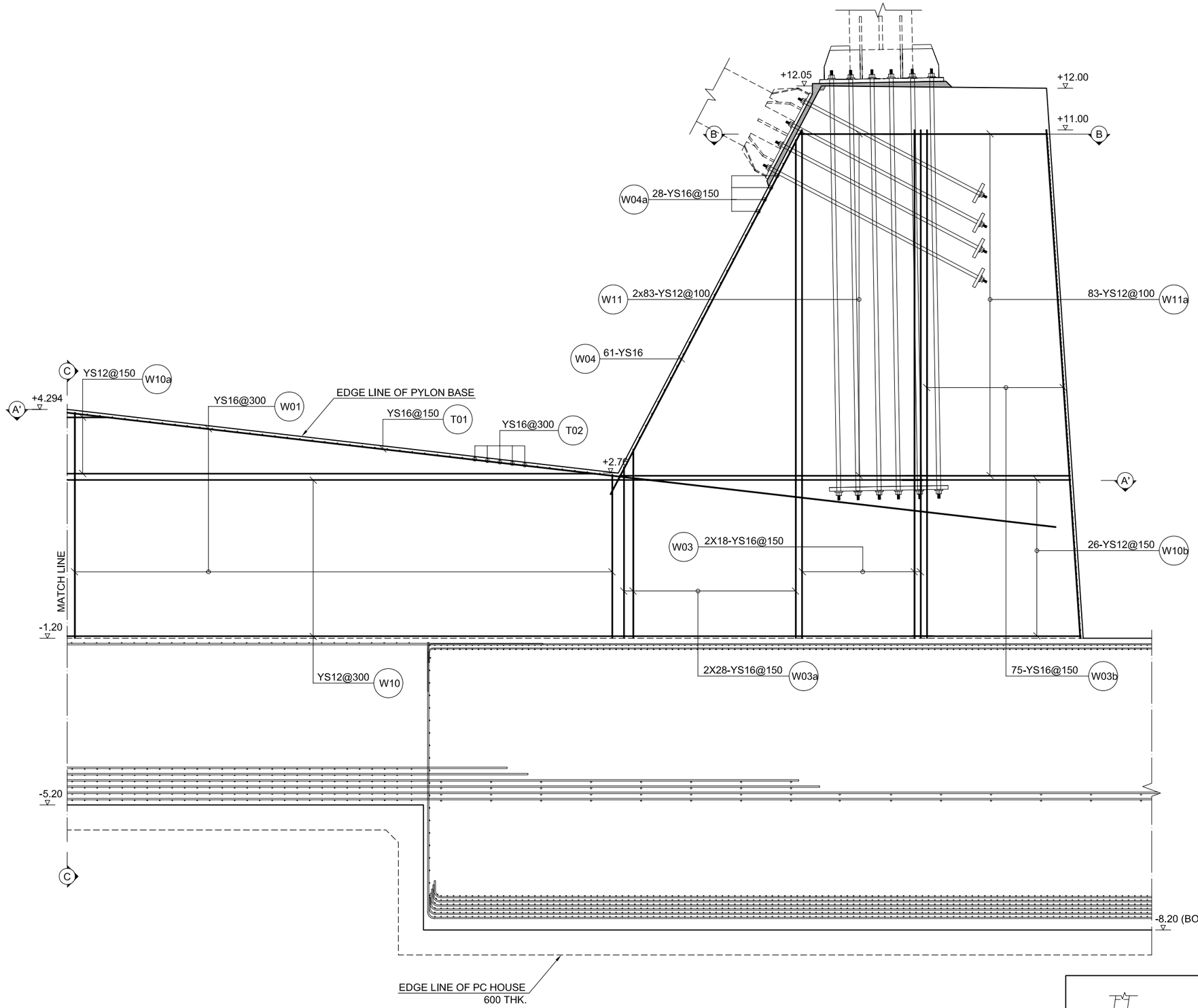
DRAWING NO.

RA140-22-BRG-CW-DW-32255

REV.

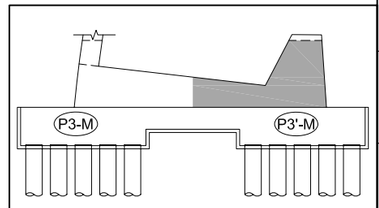
B2

A1(594x841mm ±2mm)



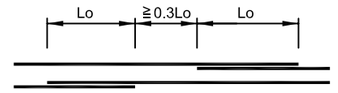
ELEVATION VIEW OF PYLON BASE 1/2 (P3'-M SIDE)

SCALE : 1/50



NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
   -PYLON PILE CAP : 40MPa
   -PYLON BASE : 50MPa
3. REINFORCEMENT REBARS SHALL CONFORM TO ASTM A706 GRADE 80(550 MPa) FOR CARBON REBARS(YH).
4. THE STAINLESS STEEL REINFORCEMENT IS RIBBED BARS.
5. MINIMUM CONRETE COVER TO REINFORCEMENT SHALL BE 100mm.
6. FOR SECTION A'-A' REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32257.
7. FOR SECTION B-B, C-C REFER TO DRAWING NO.RA140-22-BRG-CW-DW-32258.
8. THE LONGITUDINAL DISTANCE BETWEEN TWO ADJACENT LAPS SHOULD NOT BE LESS THAN 0.3Lo(LAP LENGTH)



STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).

REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B2	10/09/15	Updated As Shown In Clouds	SWK	HSH	DKK
B1	12/08/15	Updated As Shown In Clouds	SWK	HSH	DKK
A3	17/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	17/05/15	First Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (P3-M, P3'-M)
STAINLESS STEEL ARRANGEMENT 2/4

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED				
17/05/15	17/05/15	17/05/15	17/05/15	17/05/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

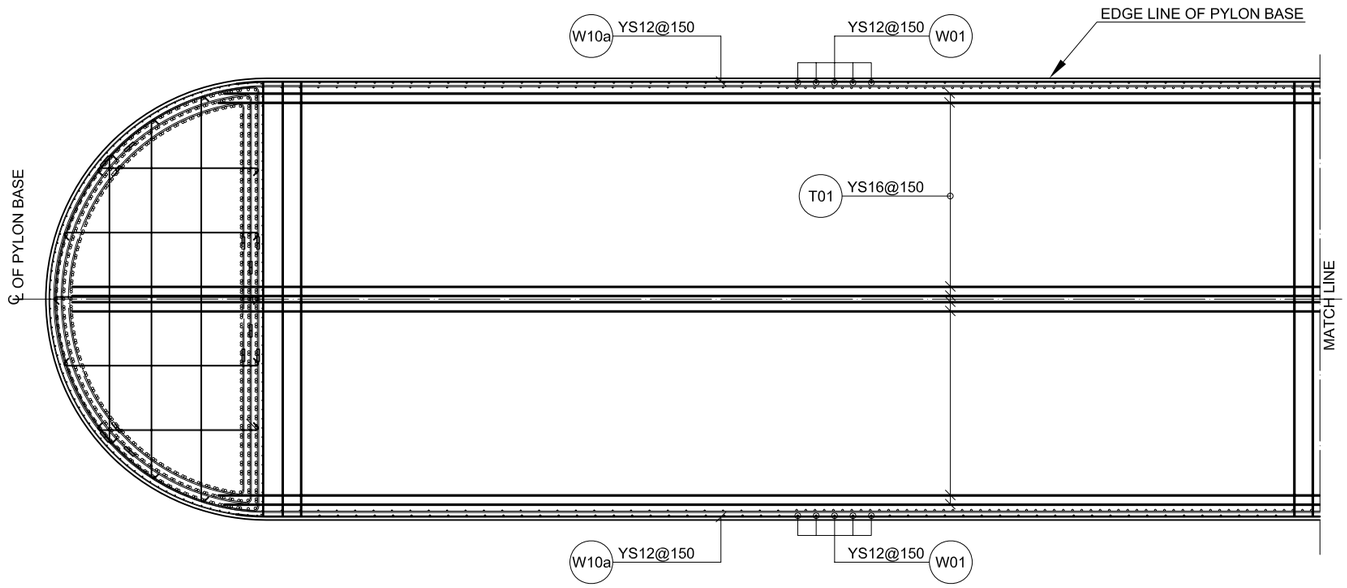
DESIGNER

SYSTRA

DRAWING NO. RA140-22-BRG-CW-DW-32256

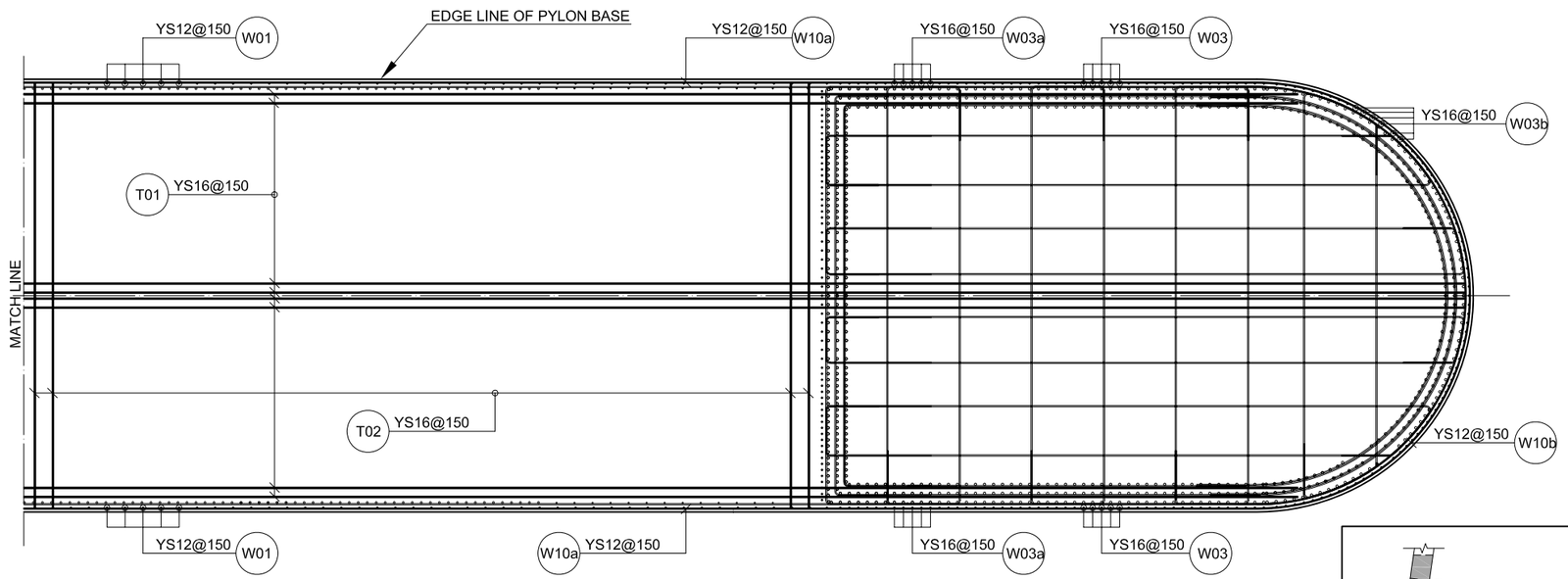
REV. B2

A1(594x841mm +2mm)



SECTION A-A (P3-M SIDE)

SCALE : 1/50

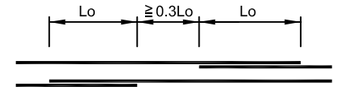


SECTION A'-A'(P3'-M SIDE)

SCALE : 1/50

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
   -PYLON PILE CAP : 40MPa
   -PYLON BASE : 50MPa
3. CARBON REBARS(YH).
4. THE STAINLESS STEEL REINFORCEMENT IS RIBBED BARS.
5. MINIMUM CONRETE COVER TO REINFORCEMENT SHALL BE 100mm.
6. FOR SECTION A-A REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32255.
7. FOR SECTION A'-A', REFER TO DRAWING NO.RA140-22-BRG-CW-DW-32256.
8. THE LONGITUDINAL DISTANCE BETWEEN TWO ADJACENT LAPS SHOULD NOT BE LESS THAN 0.3Lo(LAP LENGTH)



STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744
AND DELIVERED WITH A 'CARES' CERTIFICATE
CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).

REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B1	12/08/15	Updated As Shown In Clouds	SWK	HSH	DKK
A4	20/07/15	Updated As Shown In Clouds	SWK	HSH	DKK
A3	17/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	17/05/15	First Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (P3-M, P3'-M)
STAINLESS STEEL ARRANGEMENT 3/4

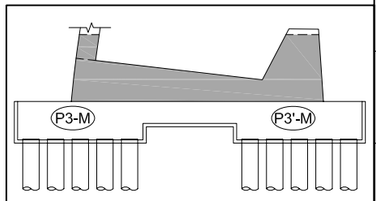
SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED				
17/05/15	17/05/15	17/05/15	17/05/15	17/05/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

DESIGNER

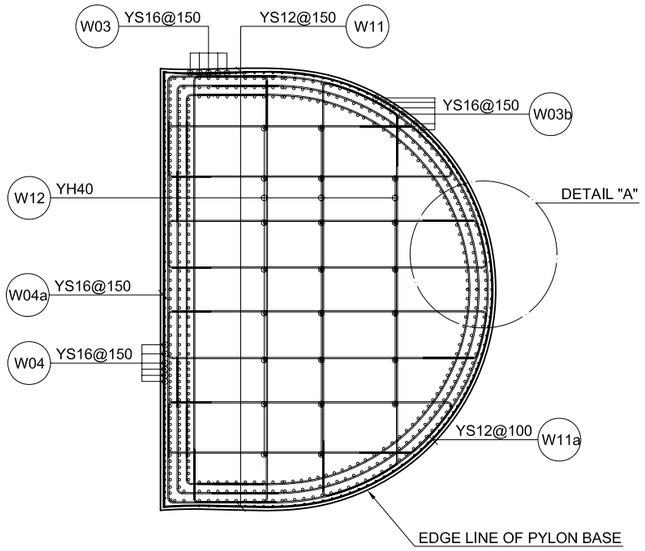
SYSTRA



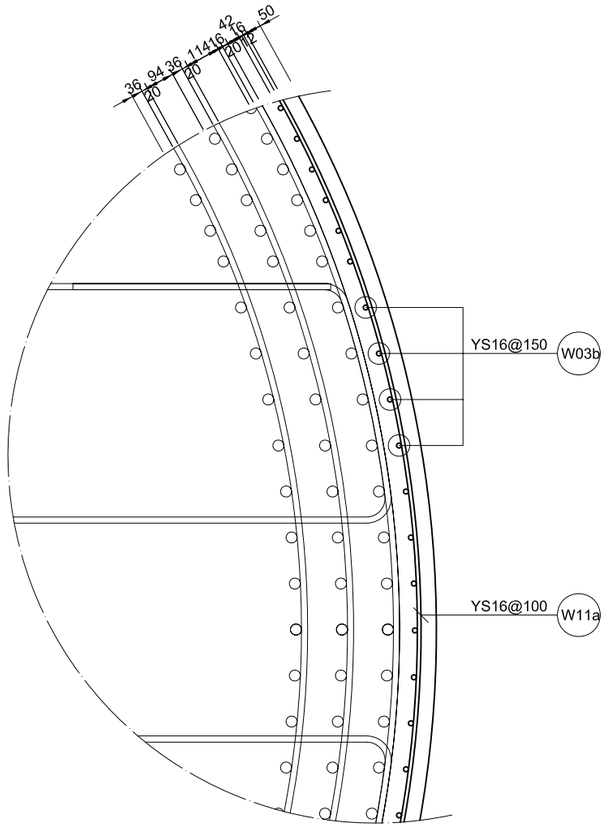
DRAWING NO. RA140-22-BRG-CW-DW-32257

REV. B1

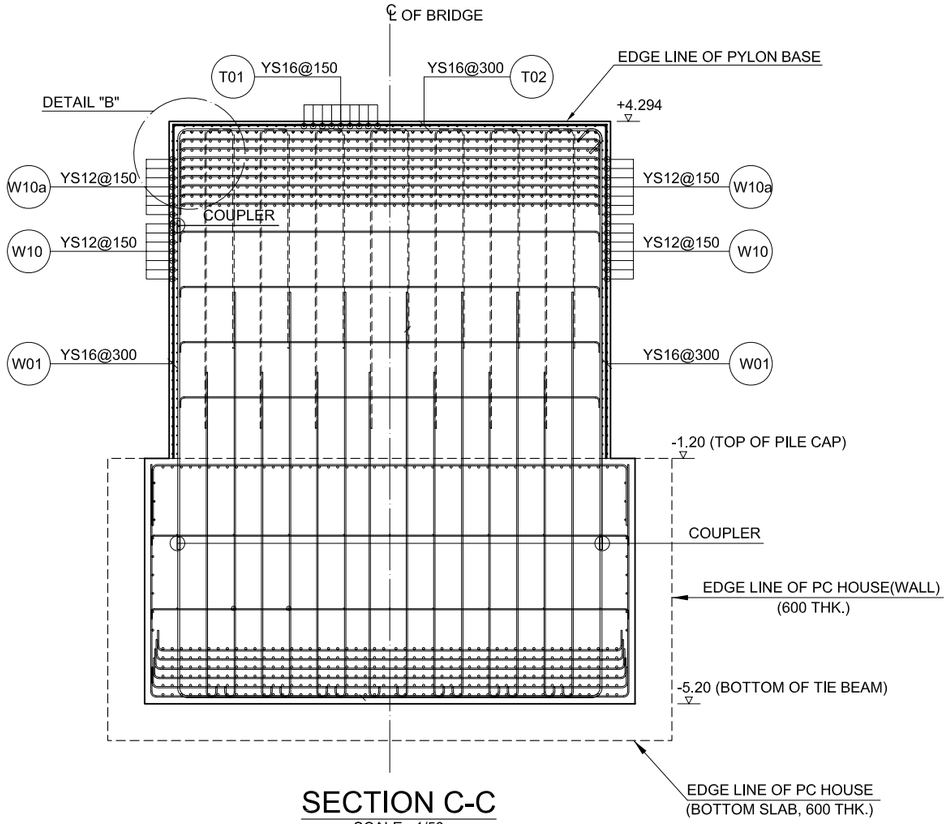
A1(594x841mm +2mm)



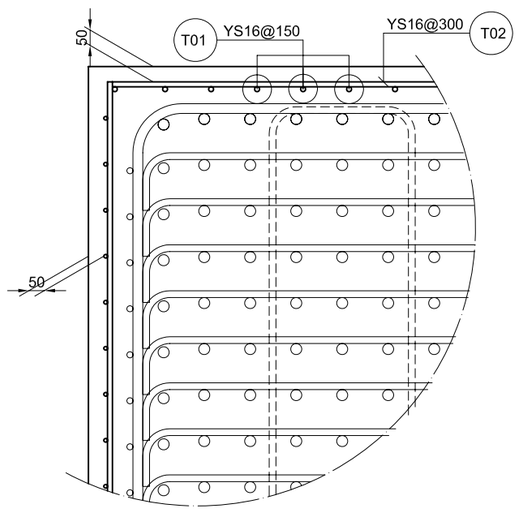
SECTION B-B
SCALE : 1/50



DETAIL "A"
SCALE : 1/10



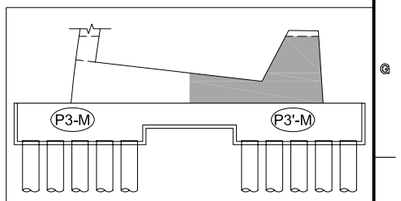
SECTION C-C
SCALE : 1/50



DETAIL "B"
SCALE : 1/10

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
   -PYLON PILE CAP : 40MPa
   -PYLON BASE : 50MPa
3. REINFORCEMENT REBARS SHALL CONFORM TO ASTM A706 GRADE 80(550 MPa) FOR CARBON REBARS(YH).
4. THE STAINLESS STEEL REINFORCEMENT IS RIBBED BARS.
5. MINIMUM CONRETE COVER TO REINFORCEMENT SHALL BE 100mm.
6. FOR SECTION B-B, C-C REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32256.
7. THE LONGITUDINAL DISTANCE BETWEEN TWO ADJACENT LAPS SHOULD NOT BE LESS THAN 0.3Lo(LAP LENGTH)



STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).

REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B1	12/08/15	Updated As Shown In Clouds	SWK	HSH	DKK
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A3	17/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	17/05/15	FIrst Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (P3-M, P3'-M)
STAINLESS STEEL ARRANGEMENT 4/4

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED				
17/05/15	17/05/15	17/05/15	17/05/15	17/05/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

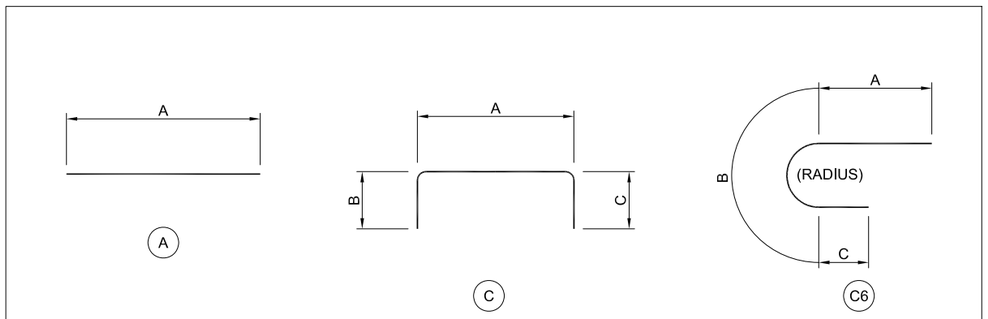
DESIGNER

SYSTRA

DRAWING NO. RA140-22-BRG-CW-DW-32258

REV. B1

A1(594x841mm +2mm)



REINFORCING BAR DATA														
DIAMETER		YS10	YS12	YS14	YS16	-	YS20	-	YS25	-	YS32	-	YS40	UNITS
UNIT WEIGHT		0.612	0.882	1.200	1.569	-	2.451	-	3.829	-	6.273	-	9.801	kg / m
LAP LENGTH (fy=500Mpa)	TYPICAL	410	495	575	660	-	820	-	1,050	-	1,730	-	2,720	mm
	TOP BAR	570	685	800	915	-	1,140	-	1,475	-	2,435	-	3,800	mm

CALCULATIONS

MARKS	DIA.	SHAPE	NOS	REINFORCING BAR DIMENSION (mm)									LAP SPLICE (mm)		LENGTH (m)	WEIGHT (kg)
				A	B	C	D	E	F	G	H	I	LENGTH	NUMBER		
T01	YS16	A	46	41,935									915	3	2,055	3,225
T02	YS16	C	101	7,044	100	100									732	1,148
W01	YS16	A	204	5,682											1,159	1,819
W02	YS16	A	4	5,312											21	33
W03	YS16	A	36	12,224									660	1	464	728
W03a	YS16	A	56	7,988											447	702
W03b	YS16	A	75	12,228									660	1	967	1,517
W04	YS16	A	61	9,881											603	946
W04a	YS16	A	28	7,100											199	312
W10	YS12	A	52	39,006									495	3	2,106	1,857
W10a	YS12	A	46	16,447									495	1	779	687
W10b	YS12	C6	26	495	11,134	495							495	1	328	289
W11	YS12	A	166	4,944											821	724
W11a	YS12	C6	83	495	11,134	495							495	1	1,047	924
TOTAL WEIGHT (kg)																14,910
TOTAL WEIGHT (TON)																14,910

QUANTITY TABLE OF REINFORCING BAR (STAINLESS STEEL)

SCALE : NONE

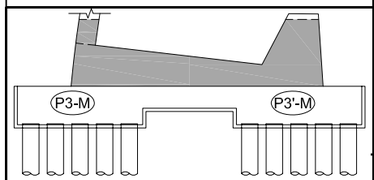
NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
   -PYLON PILE CAP : 40MPa
   -PYLON BASE : 50MPa
3. REINFORCEMENT REBARS SHALL CONFORM TO ASTM A706 GRADE 80(550 MPa) FOR CARBON REBARS(YH).
4. THE STAINLESS STEEL REINFORCEMENT IS RIBBED BARS.
5. MINIMUM CONRETE COVER TO REINFORCEMENT SHALL BE 100mm.

STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).



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B1	12/08/15	Updated As Shown In Clouds	SWK	HSH	DKK
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A2	05/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	17/05/15	First Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (P3-M, P3'-M)
STAINLESS STEEL BAR LIST

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED				
17/05/15	17/05/15	17/05/15	17/05/15	17/05/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

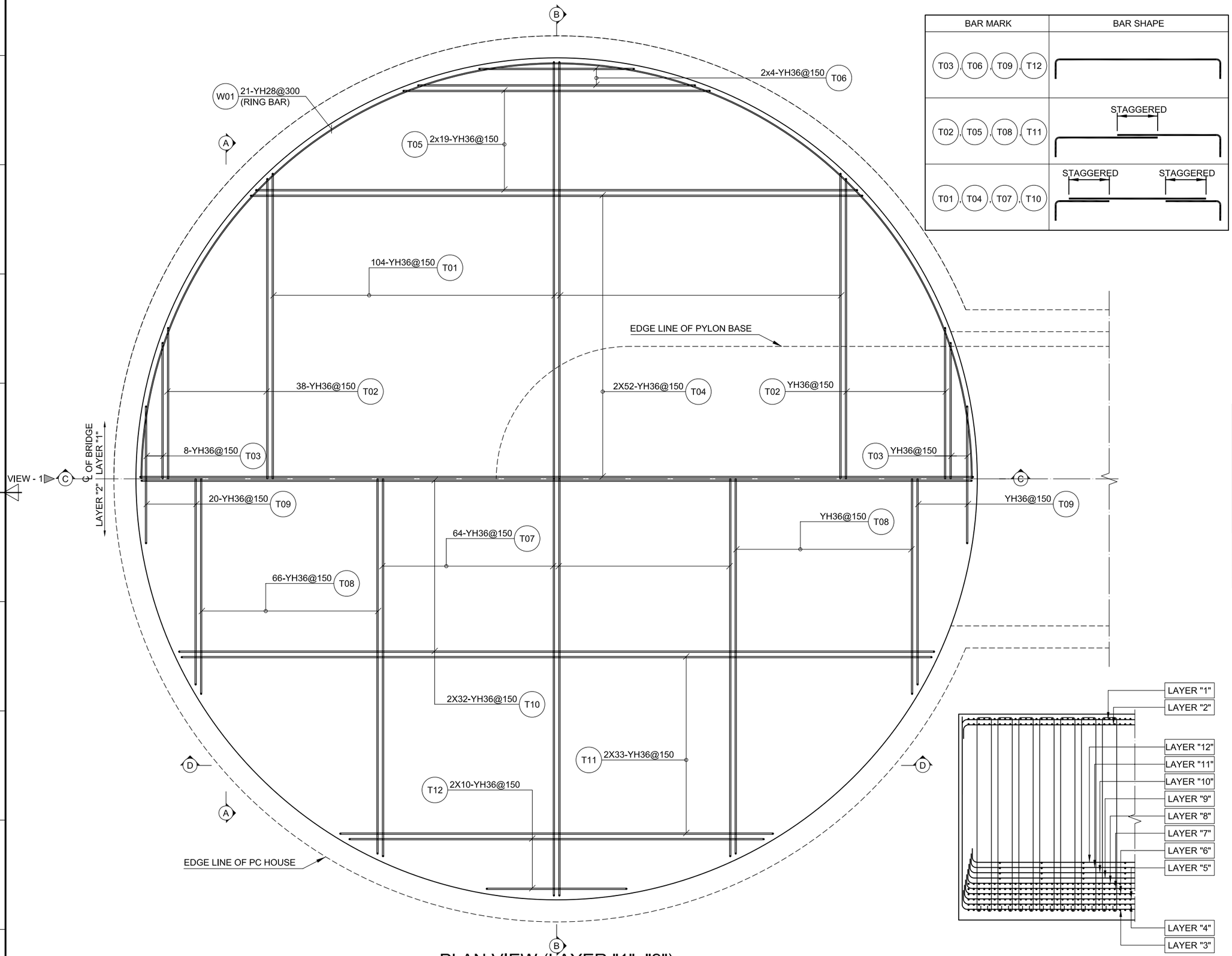
DESIGNER

SYSTRA

DRAWING NO. RA140-22-BRG-CW-BS-32259

REV. B1

A1(594x841mm +2mm)



PLAN VIEW (LAYER "1", "2")

SCALE : 1/50

BAR MARK	BAR SHAPE
T03, T06, T09, T12	
T02, T05, T08, T11	STAGGERED
T01, T04, T07, T10	STAGGERED STAGGERED

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
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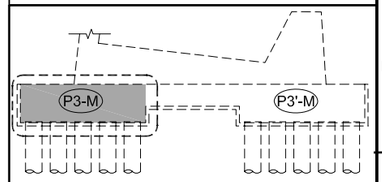
   -PYLON BASE : 50MPa
3. REINFORCEMENT REBARS SHALL CONFORM TO ASTM A706 GRADE 80(550 MPa) FOR CARBON REBARS(YH).
4. THE STAINLESS STEEL REINFORCEMENT IS RIBBED BARS.
5. MINIMUM CONRETE COVER TO REINFORCEMENT SHALL BE 100mm.
6. FOR VIEW-1 REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32267.
7. FOR SECTION A-A REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32267.
8. FOR SECTION B-B, C-C REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32268.
10. FOR SECTION D-D REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32269.

STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).



REINFORCEMENT LAYER

SCALE : NONE

REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B1	10/09/15	Updated As Shown In Clouds	SWK	HSH	DKK
A4	17/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A3	05/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	08/04/15	First Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (P3-M)
REINFORCEMENT ARRANGEMENT 1/9

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED	08/04/15	08/04/15	08/04/15	08/04/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

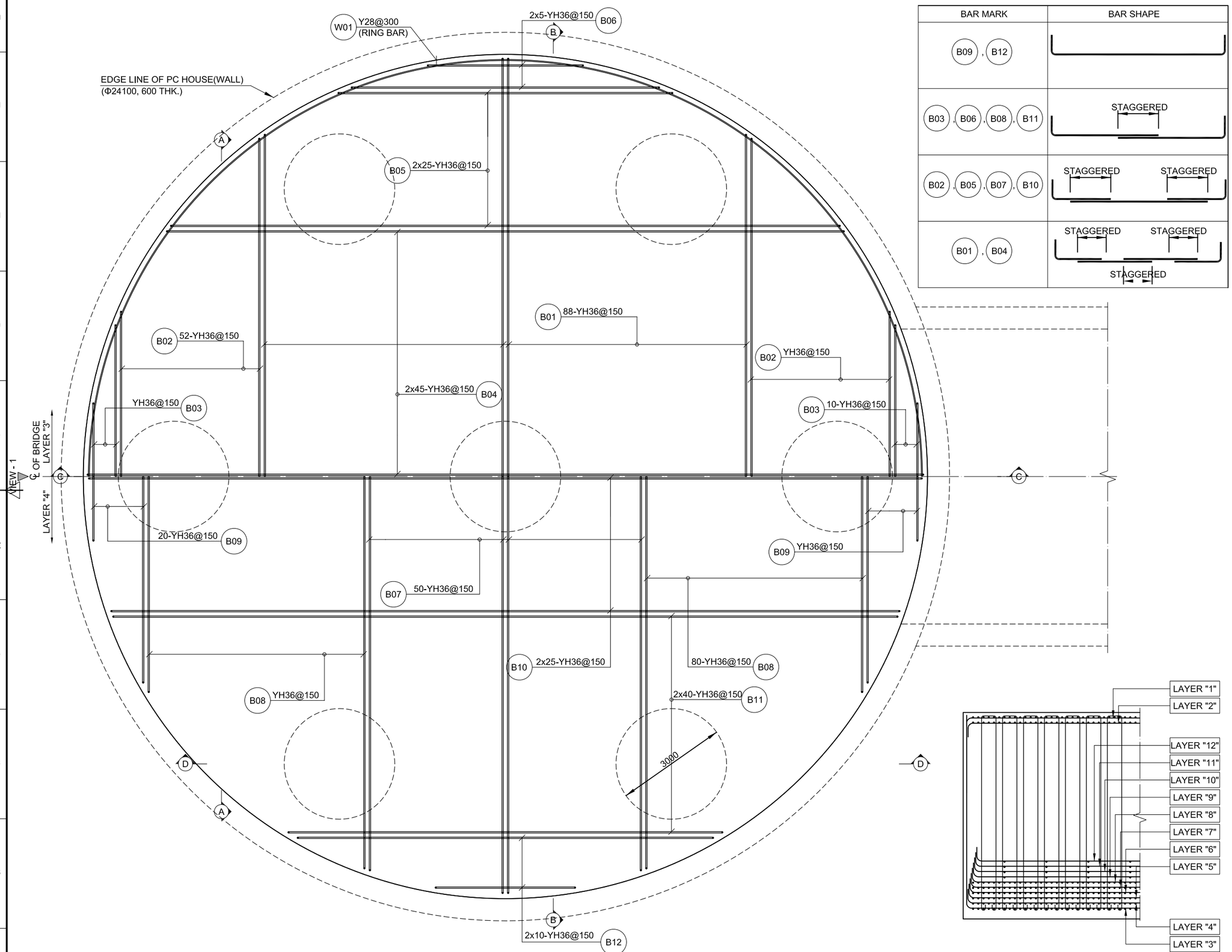
DESIGNER

SYSTRA

DRAWING NO. RA140-22-BRG-CW-DW-32261

REV. B1

A1(594x841mm +2mm)



PLAN VIEW(LAYER "3", "4")

SCALE : 1/50

BAR MARK	BAR SHAPE
B09 , B12	
B03 , B06 , B08 , B11	STAGGERED
B02 , B05 , B07 , B10	STAGGERED STAGGERED
B01 , B04	STAGGERED STAGGERED STAGGERED

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
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   -PYLON BASE : 50MPa
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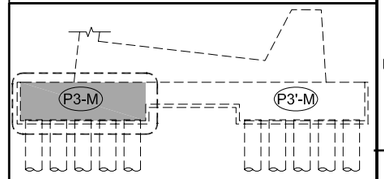
4. THE STAINLESS STEEL REINFORCEMENT IS RIBBED BARS.
5. MINIMUM CONRETE COVER TO REINFORCEMENT SHALL BE 100mm.
6. FOR VIEW-1 REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32267.
7. FOR SECTION A-A REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32267.
8. FOR SECTION B-B, C-C REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32268.
10. FOR SECTION D-D REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32269.

STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).



REINFORCEMENT LAYER

SCALE : NONE

REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B1	10/09/15	Updated As Shown In Clouds	SWK	HSH	DKK
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A1	08/04/15	First Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (P3-M)
REINFORCEMENT ARRANGEMENT 2/9

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED				
08/04/15	08/04/15	08/04/15	08/04/15	08/04/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

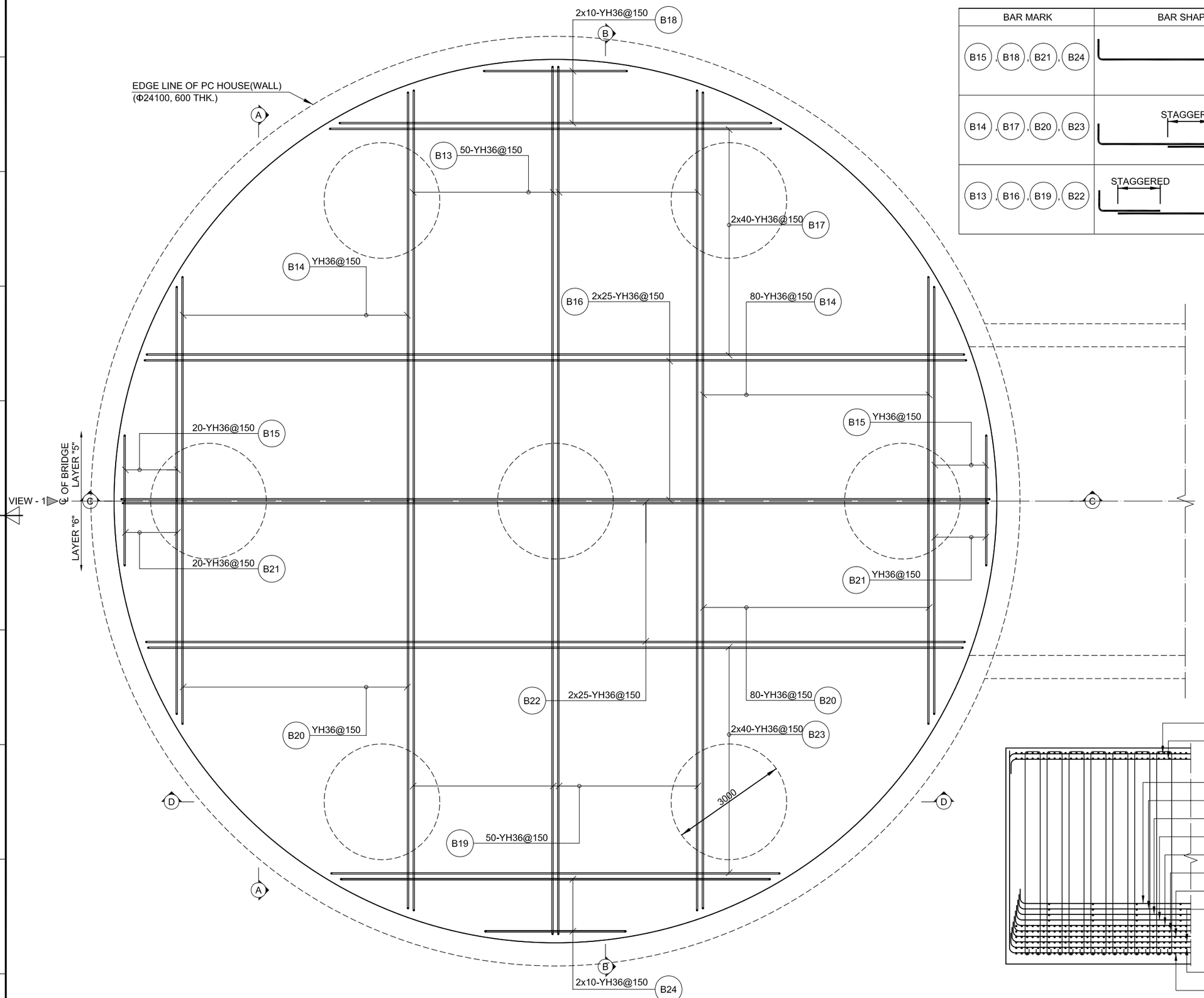
DESIGNER

SYSTRA

DRAWING NO. RA140-22-BRG-CW-DW-32262

REV. B1

A1(594x841mm +2mm)



PLAN VIEW(LAYER "5", "6")

SCALE : 1/50

BAR MARK	BAR SHAPE
B15 , B18 , B21 , B24	
B14 , B17 , B20 , B23	STAGGERED
B13 , B16 , B19 , B22	STAGGERED STAGGERED

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
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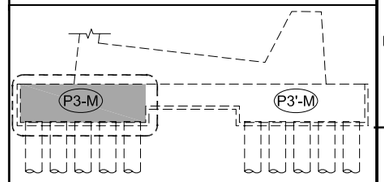
6. FOR VIEW-1 REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32267.
7. FOR SECTION A-A REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32267.
8. FOR SECTION B-B, C-C REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32268.
10. FOR SECTION D-D REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32269.

STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).



REINFORCEMENT LAYER

SCALE : NONE

REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B1	10/09/15	Updated As Shown In Clouds	SWK	HSH	DKK
A4	17/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A3	05/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	08/04/15	FIrst Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (P3-M)
REINFORCEMENT ARRANGEMENT 3/9

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED				
08/04/15	08/04/15	08/04/15	08/04/15	08/04/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

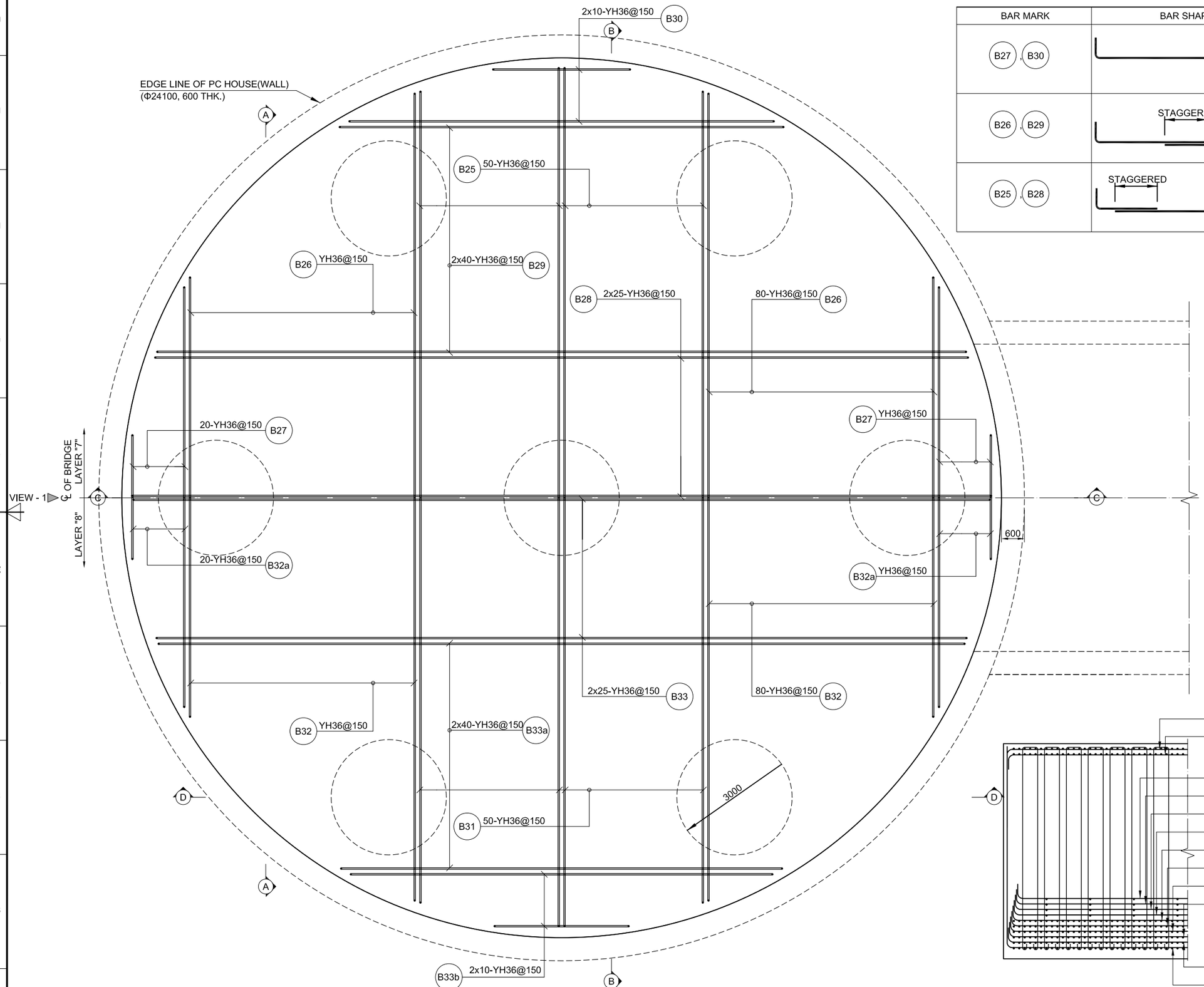
DESIGNER

SYSTRA

DRAWING NO. RA140-22-BRG-CW-DW-32263

REV. B1

A1(594x841mm +-2mm)



PLAN VIEW(LAYER "7", "8")

SCALE : 1/50

BAR MARK	BAR SHAPE
B27 , B30	
B26 , B29	STAGGERED
B25 , B28	STAGGERED STAGGERED

NOTES:

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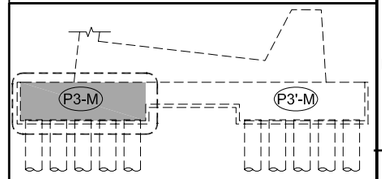
7. FOR SECTION A-A REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32267.
8. FOR SECTION B-B, C-C REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32268.
9. FOR SECTION D-D REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32269.

STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).



REINFORCEMENT LAYER

SCALE : NONE

REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B1	10/09/15	Updated As Shown In Clouds	SWK	HSH	DKK
A4	17/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A3	05/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	08/04/15	FIrst Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (P3-M)
REINFORCEMENT ARRANGEMENT 4/9

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED	08/04/15	08/04/15	08/04/15	08/04/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

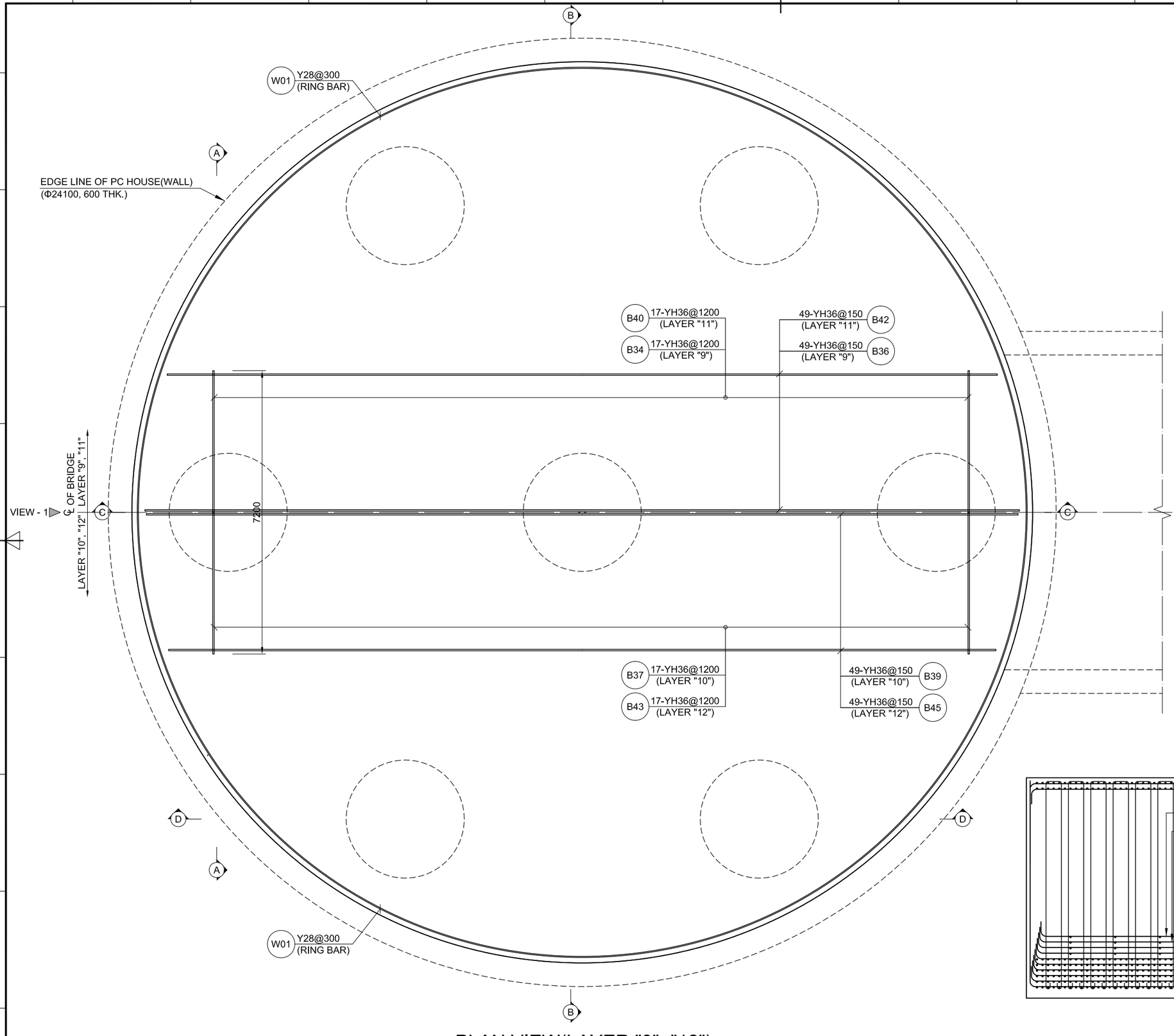
DESIGNER

SYSTRA

DRAWING NO. RA140-22-BRG-CW-DW-32264

REV. B1

A1(594x841mm +2mm)



PLAN VIEW(LAYER "9"~"12")

SCALE : 1/50

REINFORCEMENT LAYER

SCALE : NONE

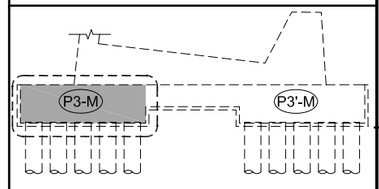
NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
   -PYLON PILE CAP : 40MPa
   -PYLON BASE : 50MPa
3. REINFORCEMENT REBARS SHALL CONFORM TO ASTM A706 GRADE 80(550 MPa) FOR CARBON REBARS(YH).
4. THE STAINLESS STEEL REINFORCEMENT IS RIBBED BARS.
5. MINIMUM CONRETE COVER TO REINFORCEMENT SHALL BE 100mm.
6. FOR VIEW-1 REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32267.
7. FOR SECTION A-A REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32267.
8. FOR SECTION B-B, C-C REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32268.
10. FOR SECTION D-D REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32269.

STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).



REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B1	10/09/15	Updated As Shown In Clouds	SWK	HSH	DKK
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A3	05/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	08/04/15	FIrst Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (P3-M)
REINFORCEMENT ARRANGEMENT 5/9

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED				
08/04/15	08/04/15	08/04/15	08/04/15	08/04/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

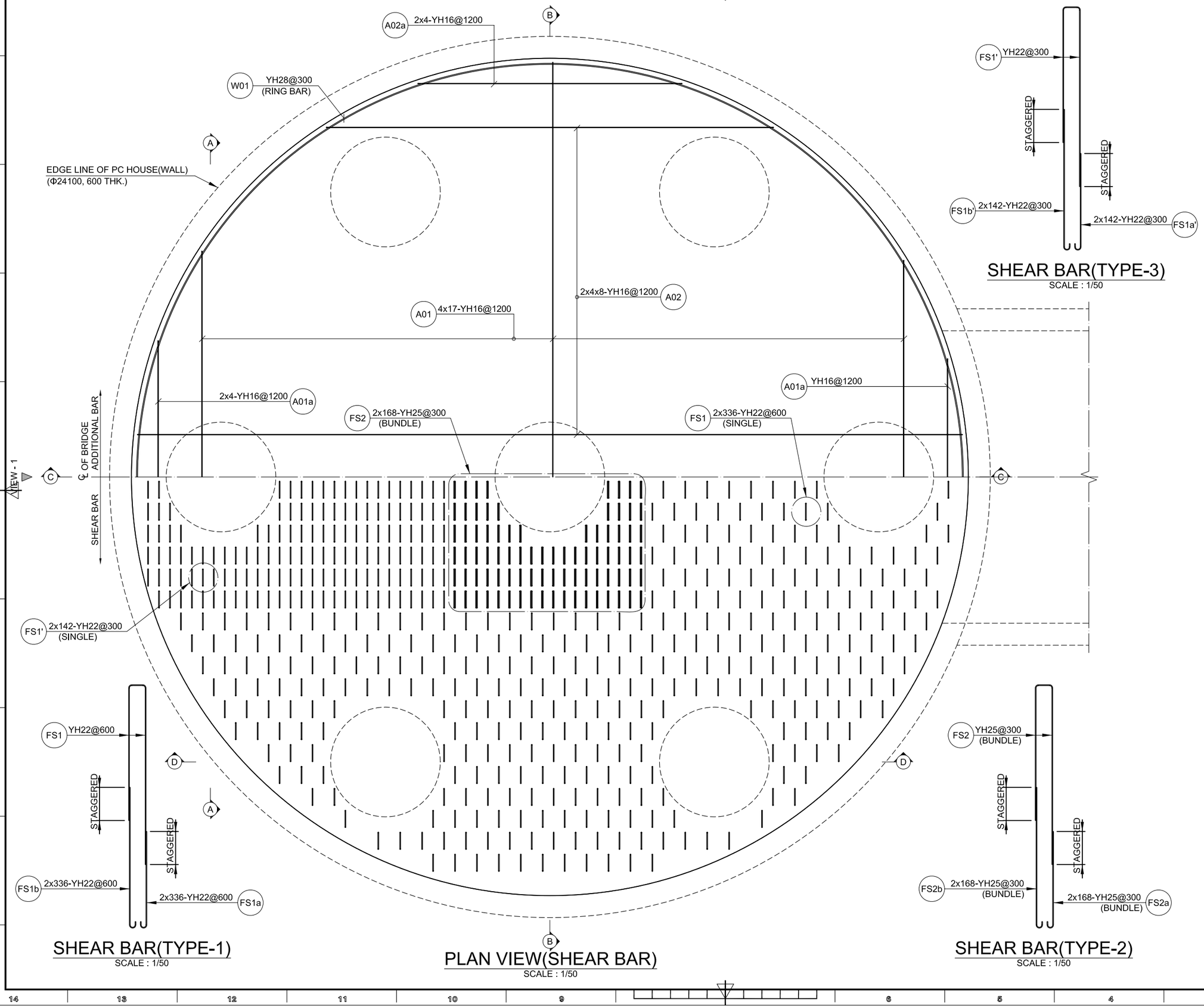
DESIGNER

SYSTRA

DRAWING NO. RA140-22-BRG-CW-DW-32265

REV. B1

A1(594x841mm +2mm) -



SHEAR BAR(TYPE-3)
SCALE : 1/50

SHEAR BAR(TYPE-1)
SCALE : 1/50

PLAN VIEW(SHEAR BAR)
SCALE : 1/50

SHEAR BAR(TYPE-2)
SCALE : 1/50

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
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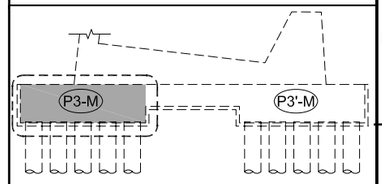
6. FOR VIEW-1 REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32267.
7. FOR SECTION A-A REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32267.
8. FOR SECTION B-B, C-C REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32268.
9. FOR SECTION D-D REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32269.

STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).



REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B2	10/09/15	Updated As Shown In Clouds	SWK	HSH	DKK
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A4	17/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	08/04/15	First Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (P3-M)
REINFORCEMENT ARRANGEMENT 6/9

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED				
08/04/15	08/04/15	08/04/15	08/04/15	08/04/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

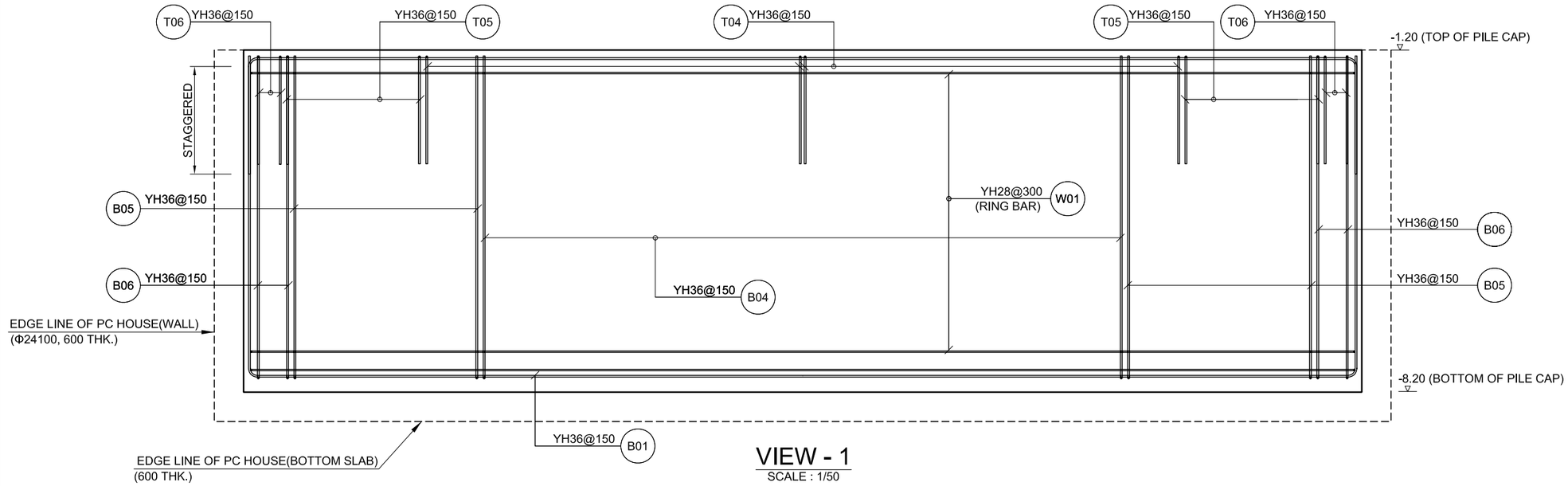
DESIGNER

SYSTRA

DRAWING NO. RA140-22-BRG-CW-DW-32266

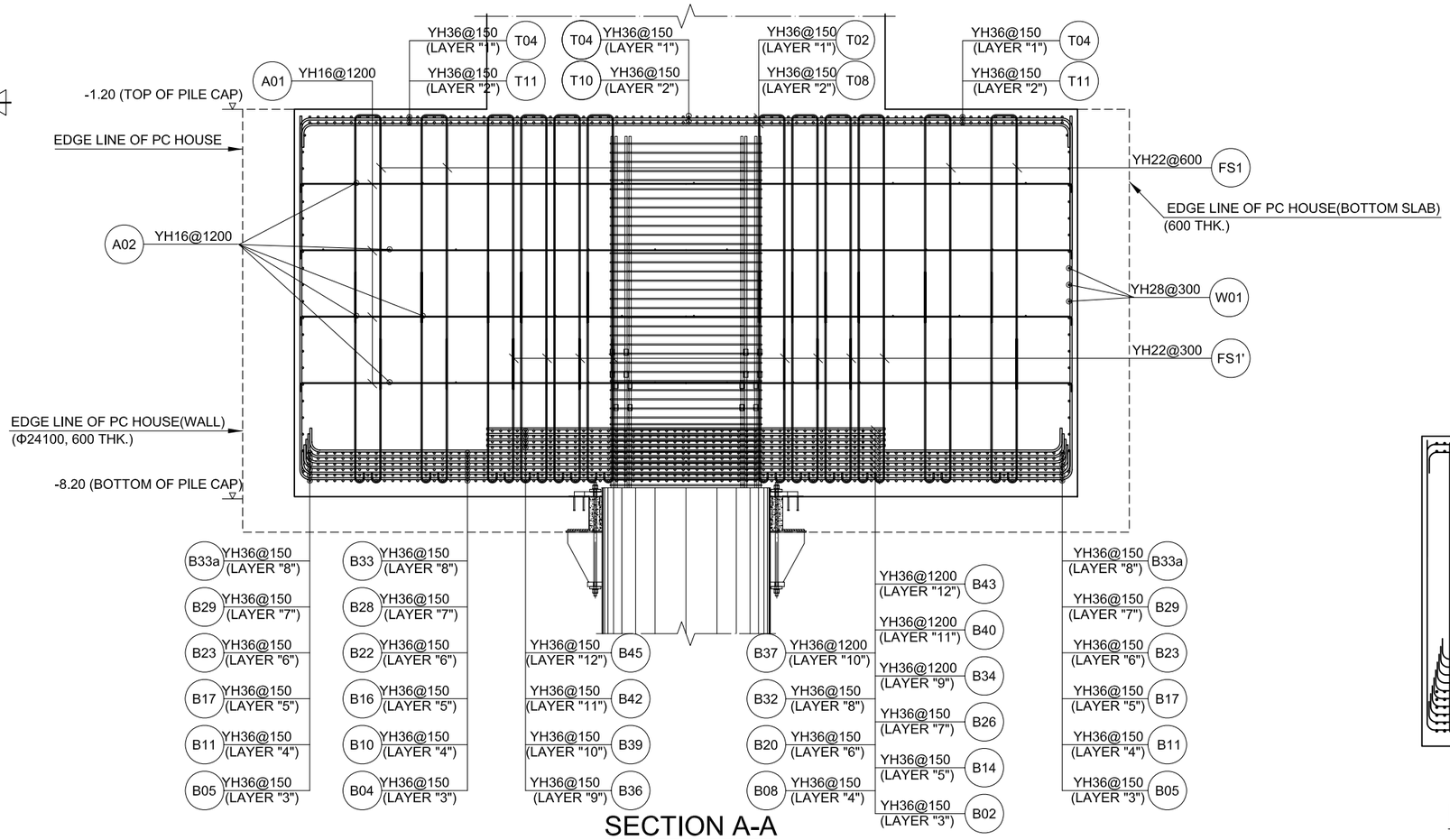
REV. B2

A1(594x841mm +2mm)



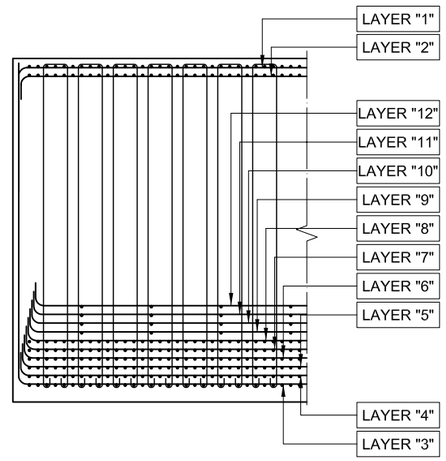
VIEW - 1

SCALE : 1/50



SECTION A-A

SCALE : 1/50



REINFORCEMENT LAYER

SCALE : NONE

NOTES:

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6. FOR VIEW-1 REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32261 TO 32266.
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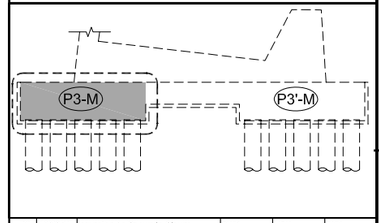
STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).



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EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (P3-M)
REINFORCEMENT ARRANGEMENT 7/9

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED	08/04/15	08/04/15	08/04/15	08/04/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

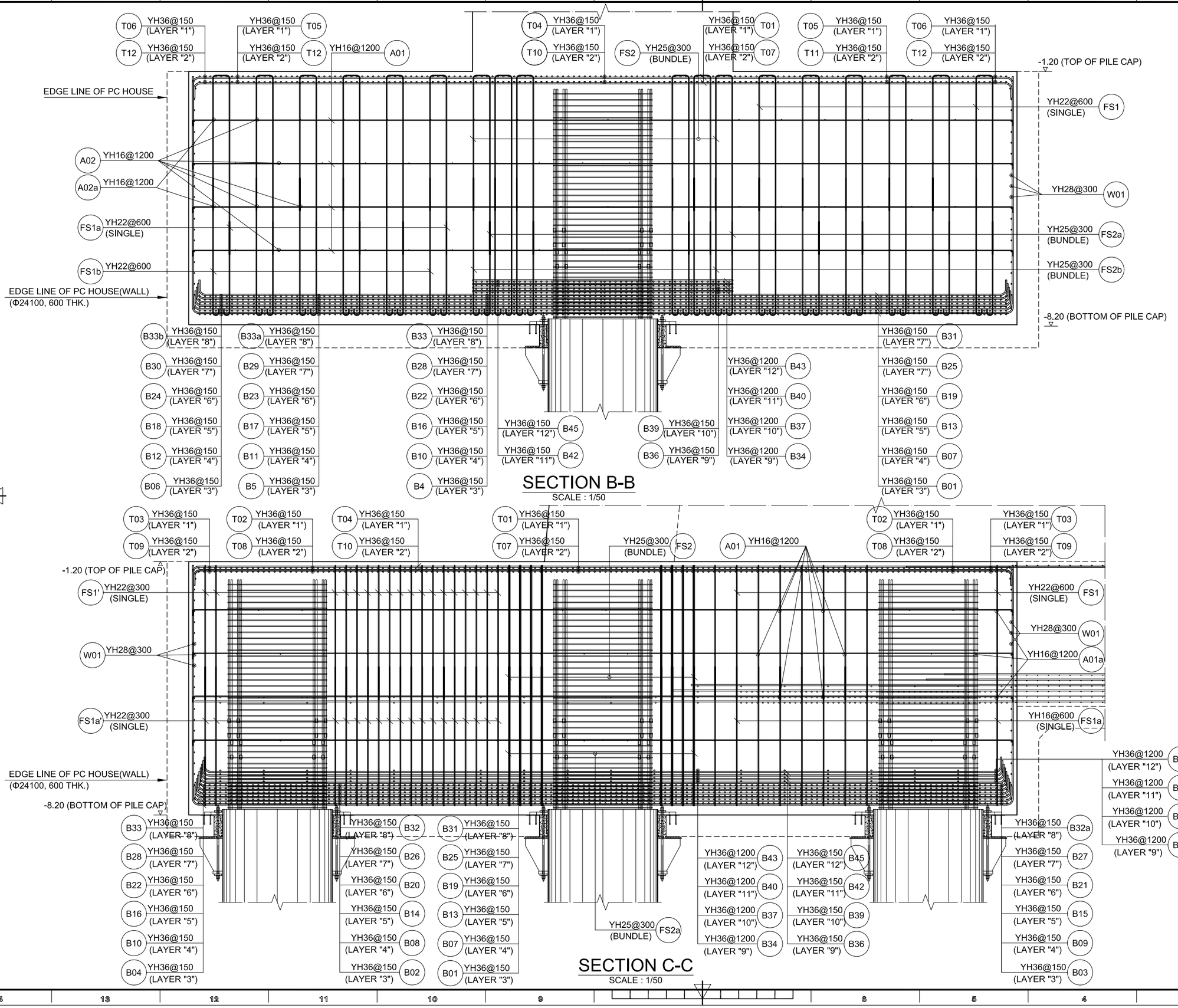
DESIGNER

SYSTRA

DRAWING NO. RA140-22-BRG-CW-DW-32267

REV. B2

A1(594x841mm +-2mm)



SECTION B-B
SCALE : 1/50

SECTION C-C
SCALE : 1/50

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
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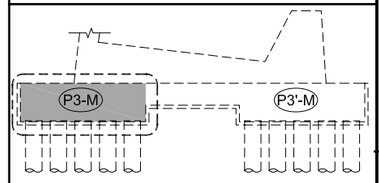
FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).



REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
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EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (P3-M)
REINFORCEMENT ARRANGEMENT 8/9

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED	08/04/15	08/04/15	08/04/15	08/04/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

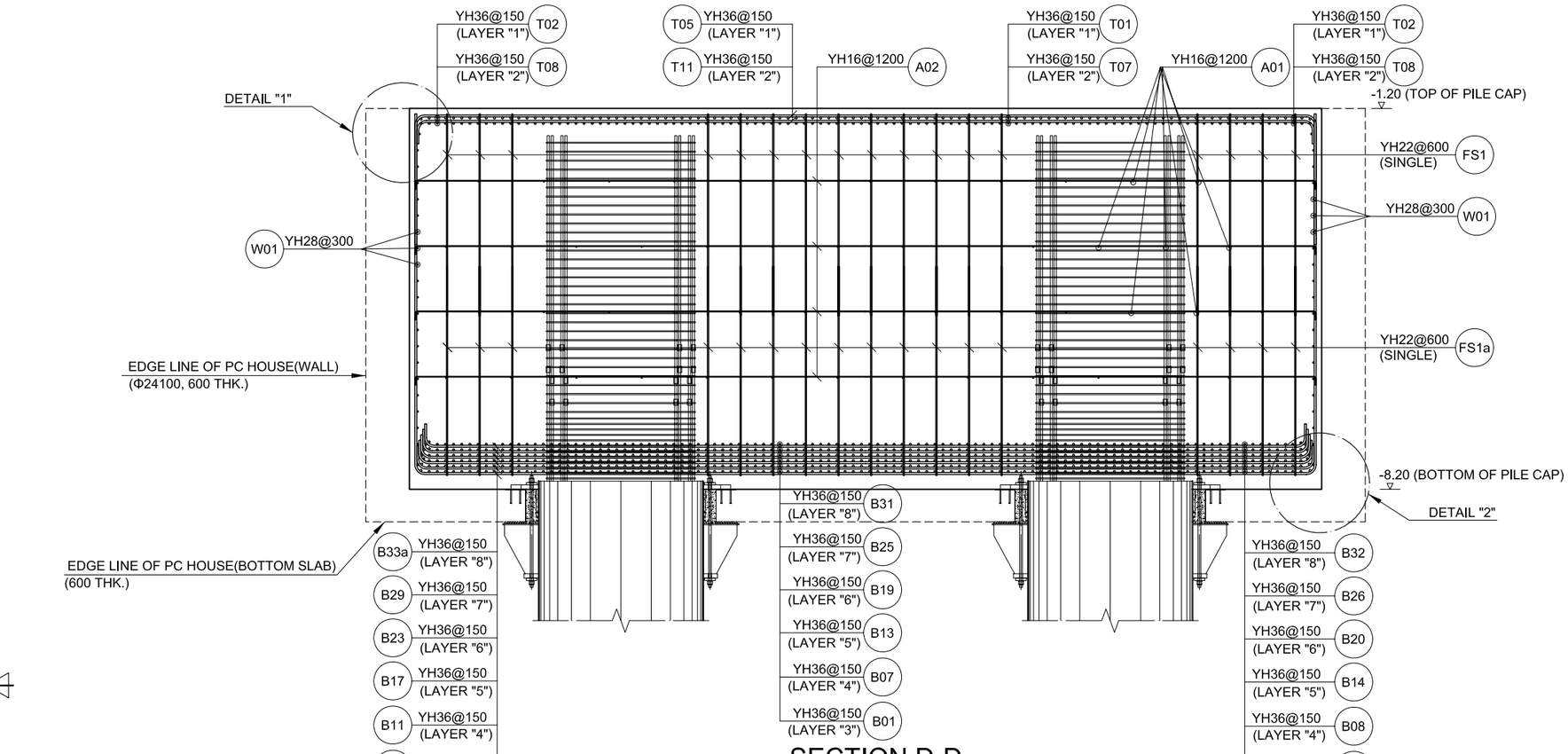
DESIGNER

SYSTRA

DRAWING NO. RA140-22-BRG-CW-DW-32268

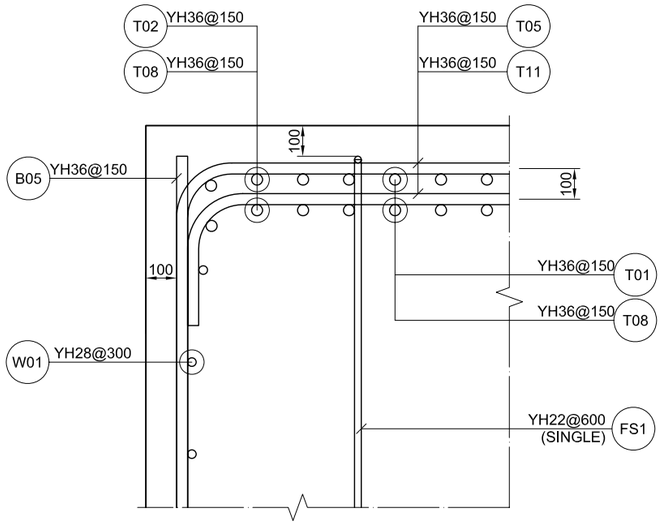
REV. B2

A1(594x841mm +2mm)



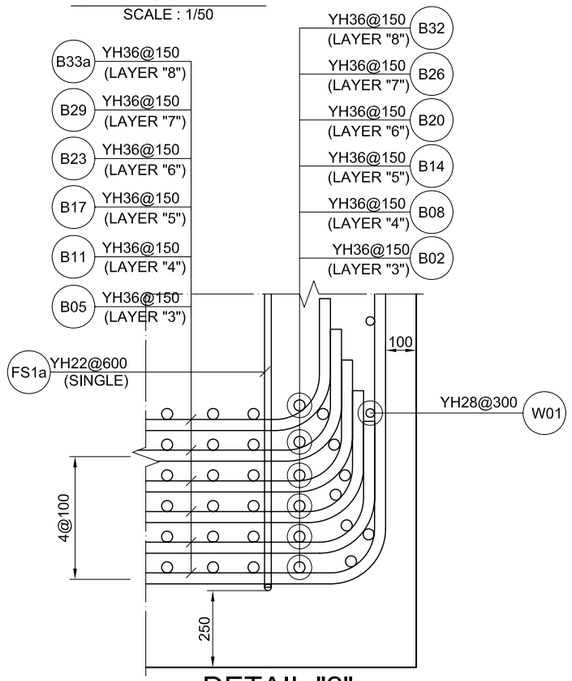
SECTION D-D

SCALE : 1/50



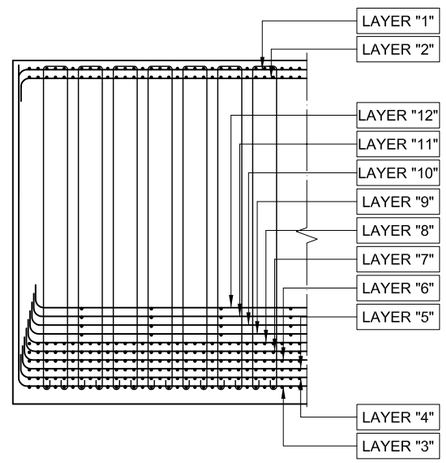
DETAIL "1"

SCALE : 1/10



DETAIL "2"

SCALE : 1/10



REINFORCEMENT LAYER

SCALE : NONE

NOTES:

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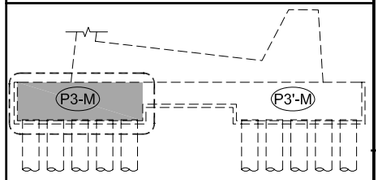
FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).



REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B1	10/09/15	Updated As Shown In Clouds	SWK	HSH	DKK
A4	17/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A3	05/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
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EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (P3-M)
REINFORCEMENT ARRANGEMENT 9/9

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED				
08/04/15	08/04/15	08/04/15	08/04/15	08/04/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

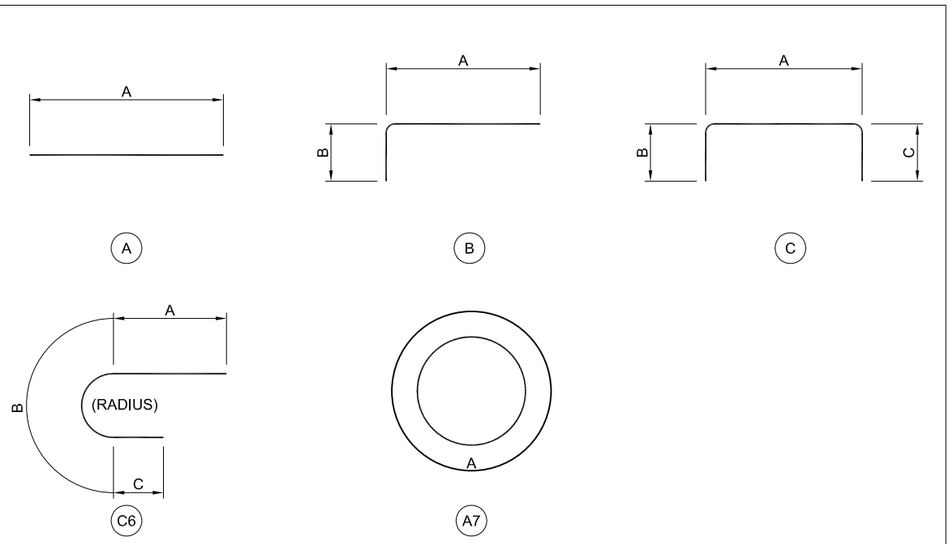
DESIGNER

SYSTRA

DRAWING NO. RA140-22-BRG-CW-DW-32269

REV. B1

A1(594x841mm +2mm)



REINFORCING BAR DATA														
DIAMETER		YH10	YH12	YH14	YH16	YH18	YH20	YH22	YH25	YH28	YH32	YH36	YH40	UNITS
UNIT WEIGHT		0.617	0.888	1.210	1.580	1.994	2.470	2.983	3.850	4.840	6.310	7.991	9.860	kg / m
LAP LENGTH (fy=550Mpa)	TYPICAL	410	495	575	660	740	820	905	1,050	1,345	1,730	2,200	2,720	mm
	TOP BAR	570	685	800	915	1,030	1,140	1,255	1,475	1,850	2,435	3,060	3,800	mm

CALCULATIONS

MARKS	DIA.	SHAPE	NOS	REINFORCING BAR DIMENSION (mm)									LAP SPLICE (mm)		LENGTH (m)	WEIGHT (kg)
				A	B	C	D	E	F	G	H	I	LENGTH	NUMBER		
T01	YH36	C	104	19,630	2,200	2,200							3,060	2	3,136	25,056
T02	YH36	C	38	12,260	2,200	2,200							3,060	1	749	5,988
T03	YH36	C	8	5,664	2,200	2,200									81	643
T04	YH36	C	104	19,653	2,200	2,200							3,060	2	3,138	25,075
T05	YH36	C	38	14,737	2,200	2,200							3,060	1	843	6,740
T06	YH36	C	8	7,146	2,200	2,200									92	738
T07	YH36	C	64	22,149	250	250							3,060	2	1,841	14,713
T08	YH36	C	66	16,673	250	250							3,060	1	1,335	10,671
T09	YH36	C	20	8,089	250	250									172	1,373
T10	YH36	C	64	22,206	250	250							3,060	2	1,845	14,742
T11	YH36	C	66	16,927	250	250							3,060	1	1,352	10,805
T12	YH36	C	20	8,287	250	250									176	1,404
B01	YH36	C	88	20,530	6,390	6,390							2,200	3	3,512	28,065
B02	YH36	C	52	13,626	6,390	6,390							2,200	2	1,602	12,801
B03	YH36	C	10	8,396	6,390	6,390							2,200	1	234	1,868
B04	YH36	C	90	20,560	6,390	6,390							2,200	3	3,595	28,724
B05	YH36	C	50	13,608	6,390	6,390							2,200	2	1,539	12,301
B06	YH36	C	10	6,178	6,390	6,390							2,200	1	212	1,691
B07	YH36	C	50	21,963	250	250							2,200	2	1,343	10,733
B08	YH36	C	80	16,463	250	250							2,200	1	1,533	12,251
B09	YH36	C	20	7,757	250	250									165	1,320
B10	YH36	C	50	21,951	250	250							2,200	2	1,343	10,728
B11	YH36	C	80	16,666	250	250							2,200	1	1,549	12,380
B12	YH36	C	20	7,564	250	250									161	1,289

MARKS	DIA.	SHAPE	NOS	REINFORCING BAR DIMENSION (mm)						LAP SPLICE (mm)		HOOK (NOS)			LENGTH (m)	WEIGHT (kg)
				A	B	C	D	E	F	LENGTH	NUMBER	90°	135°	180°		
B13	YH36	C	50	21,946	250	250							2,200	2	1,342	10,726
B14	YH36	C	80	16,675	250	250							2,200	1	1,550	12,386
B15	YH36	C	20	7,436	250	250									159	1,268
B16	YH36	C	50	21,930	250	250							2,200	2	1,342	10,720
B17	YH36	C	80	16,612	250	250							2,200	1	1,545	12,346
B18	YH36	C	20	7,255	250	250									155	1,239
B19	YH36	C	50	21,925	250	250							2,200	2	1,341	10,718
B20	YH36	C	80	16,383	250	250							2,200	1	1,527	12,199
B21	YH36	C	20	6,845	250	250									147	1,174
B22	YH36	C	50	21,924	250	250							2,200	2	1,341	10,717
B23	YH36	C	80	16,370	250	250							2,200	1	1,526	12,191
B24	YH36	C	20	6,843	250	250									147	1,174
B25	YH36	C	50	21,759	250	250							2,200	2	1,333	10,651
B26	YH36	C	80	16,255	250	250							2,200	1	1,516	12,117
B27	YH36	C	20	7,110	250	250									152	1,216
B28	YH36	C	50	21,767	250	250							2,200	2	1,333	10,655
B29	YH36	C	80	16,305	250	250							2,200	1	1,520	12,150
B30	YH36	C	20	7,306	250	250									156	1,247
B31	YH36	C	50	21,722	250	250							2,200	2	1,331	10,637
B32	YH36	C	80	16,219	250	250							2,200	1	1,514	12,095
B32a	YH36	C	20	7,073	250	250									151	1,210
B33	YH36	C	50	21,733	250	250							2,200	2	1,332	10,641
B33a	YH36	C	80	16,269	250	250							2,200	1	1,518	12,127
B33b	YH36	C	20	7,270	250	250									155	1,242
B34	YH36	A	17	7,200											122	978
B36	YH36	C	49	21,651	250	250							2,200	2	1,301	10,396
B37	YH36	A	17	7,200											122	978
B39	YH36	C	49	21,579	250	250							2,200	2	1,297	10,368
B40	YH36	A	17	7,200											122	978
B42	YH36	C	49	21,507	250	250							2,200	2	1,294	10,340
B43	YH36	A	17	7,200											122	978
B45	YH36	C	49	21,435	250	250							2,200	2	1,290	10,312
W01	YH28	A7	21	70,716									1,345	6	1,655	8,008
A01	YH16	C	68	18,440	100	100							660	1	1,312	2,074
A02	YH16	C	64	17,653	100	100							660	1	1,185	1,872
A01a	YH16	C	8	8,973	100	100									73	116
A02a	YH16	C	8	8,973	100	100									73	116
FS1	YH22	C	672	476	4,956	3,751									6,171	18,408
FS1a	YH22	C6	672	2,511	242	88									1,909	5,695
FS1b	YH22	C6	672	3,716	242	88									2,719	8,111
FS1'	YH22	C	284	476	4,956	3,751									2,608	7,780
FS1a'	YH22	C6	284	2,511	242	88									807	2,407
FS1b'	YH22	C6	284	3,716	242	88									1,149	3,428
FS2	YH25	C	336	476	4,956	3,751									3,085	11,879
FS2a	YH25	C6	336	2,511	242	88									955	3,675
FS2b	YH25	C6	336	3,716	242	88									1,359	5,234
TOTAL WEIGHT (kg)																569,075
TOTAL WEIGHT (TON)																569,075

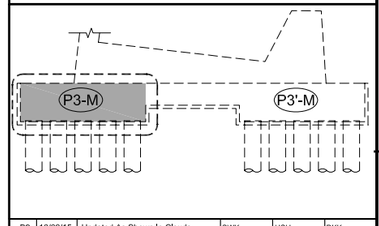
NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
   -PYLON PILE CAP : 40MPa
   -PYLON BASE : 50MPa
3. REINFORCEMENT REBARS SHALL CONFORM TO ASTM A706 GRADE 80(550 MPa) FOR CARBON REBARS(YH).
4. THE STAINLESS STEEL REINFORCEMENT IS RIBBED BARS.

STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).



REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B2	10/09/15	Updated As Shown In Clouds	SWK	HSH	DKK
B1	12/08/15	Updated As Shown In Clouds	SWK	HSH	DKK
A4	17/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	08/04/15	First Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (P3-M)
BAR LIST

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED				
08/04/15	08/04/15	08/04/15	08/04/15	08/04/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

DESIGNER

SYSTRA

DRAWING NO.

RA140-22-BRG-CW-BS-32270

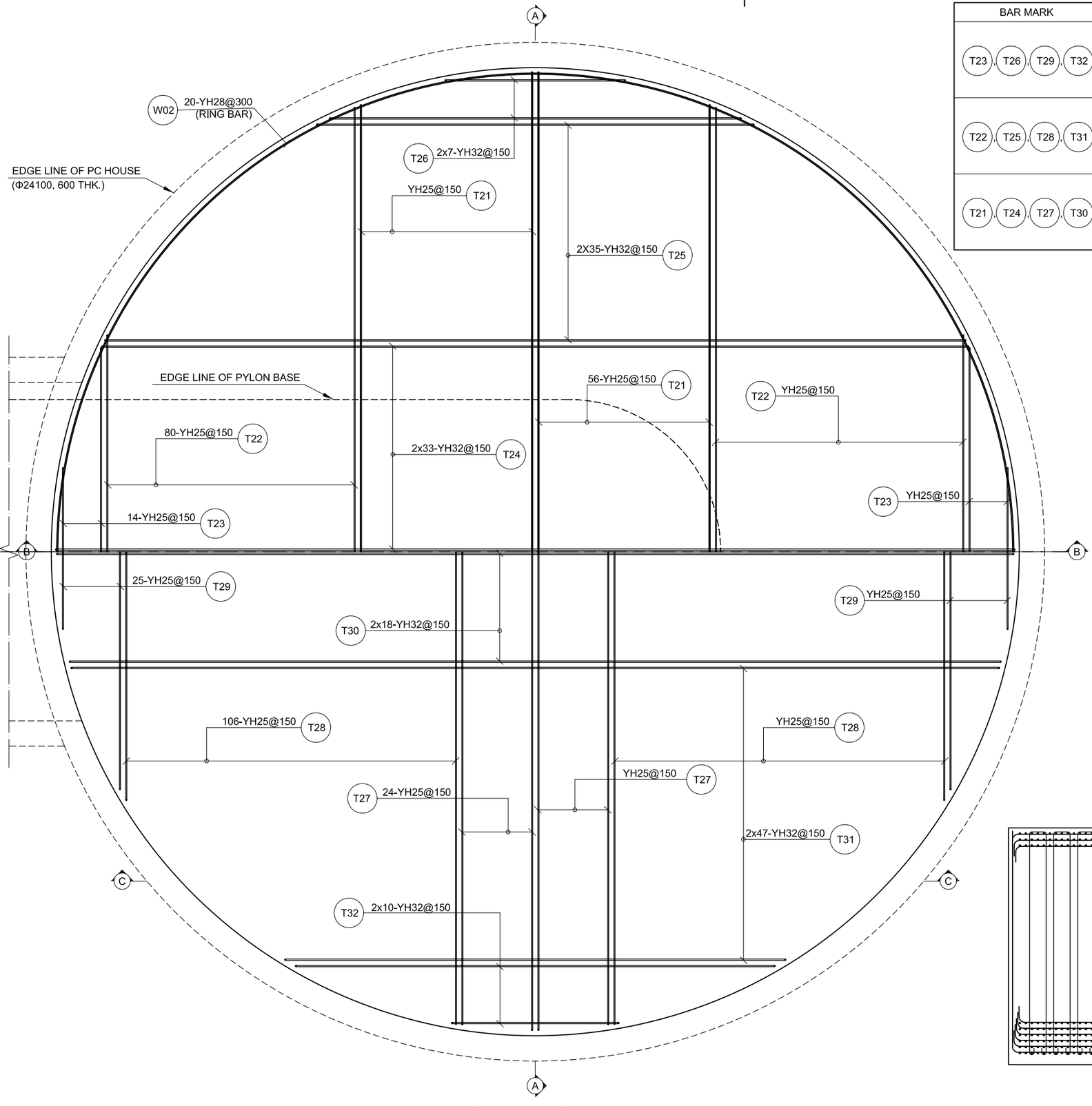
REV.

B2

QUANTITY TABLE OF REINFORCING BAR

SCALE : NONE

A1(594x841mm +2mm)



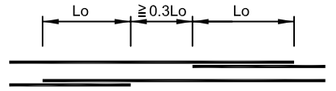
PLAN VIEW (LAYER "1", "2")

SCALE : 1/50

BAR MARK	BAR SHAPE
T23, T26, T29, T32	
T22, T25, T28, T31	STAGGERED
T21, T24, T27, T30	STAGGERED STAGGERED

NOTES:

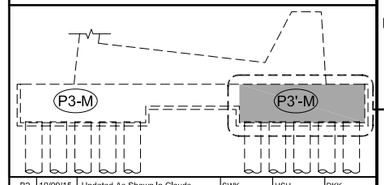
1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
   -PYLON PILE CAP : 40MPa
   -PYLON BASE : 50MPa
3. REINFORCEMENT REBARS SHALL CONFORM TO ASTM A706 GRADE 80(550 MPa) FOR CARBON REBARS(YH).
4. THE STAINLESS STEEL REINFORCEMENT IS RIBBED BARS.
5. MINIMUM CONRETE COVER TO REINFORCEMENT SHALL BE 100mm.
6. FOR VIEW-1 REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32275.
7. FOR SECTION A-A REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32275.
8. FOR SECTION B-B, C-C REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32276.

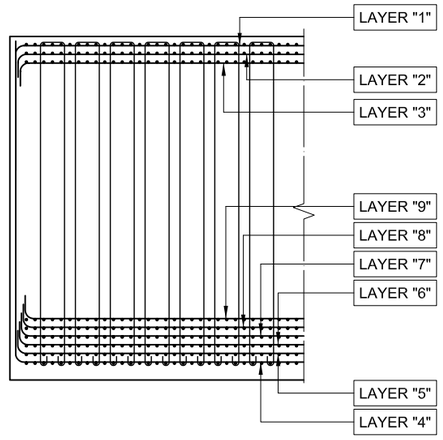


STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).





REINFORCEMENT LAYER

SCALE : NONE

REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B2	10/09/15	Updated As Shown In Clouds	SWK	HSH	DKK
B1	12/08/15	Updated As Shown In Clouds	SWK	HSH	DKK
A3	17/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	08/04/15	First Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (P3'-M)
REINFORCEMENT ARRANGEMENT 1/7

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED				
08/04/15	08/04/15	08/04/15	08/04/15	08/04/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

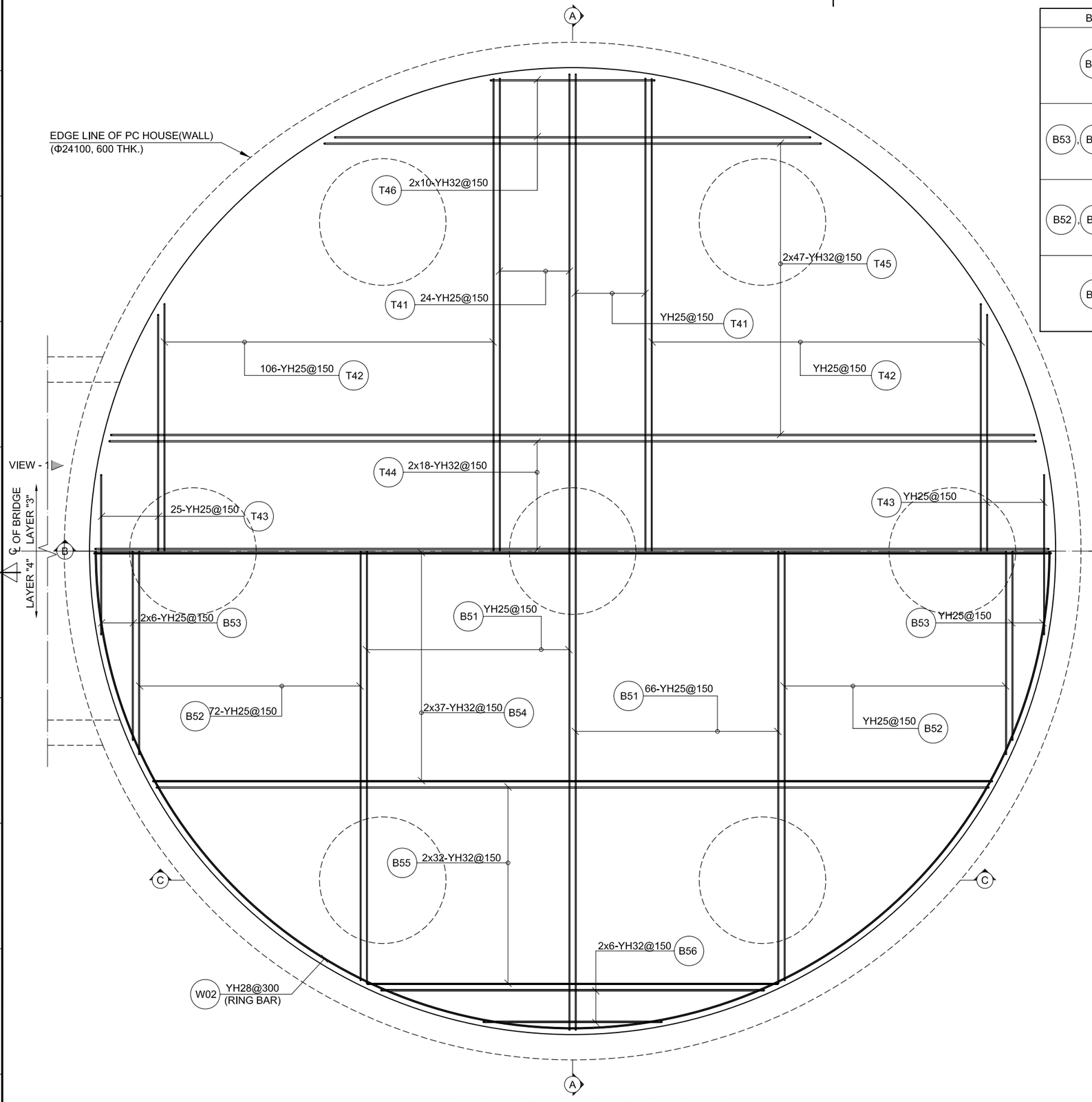
DESIGNER

SYSTRA

DRAWING NO. RA140-22-BRG-CW-DW-32271

REV. B2

A1(594x841mm +2mm) _



PLAN VIEW (LAYER "3", "4")

SCALE : 1/50

BAR MARK	BAR SHAPE
B59, B62	
B53, B56, B58, B61	STAGGERED
B52, B55, B57, B60	STAGGERED STAGGERED
B51, B54	STAGGERED STAGGERED STAGGERED

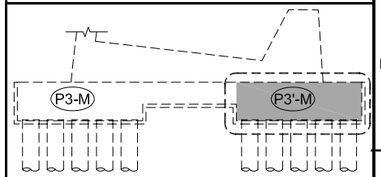
NOTES:

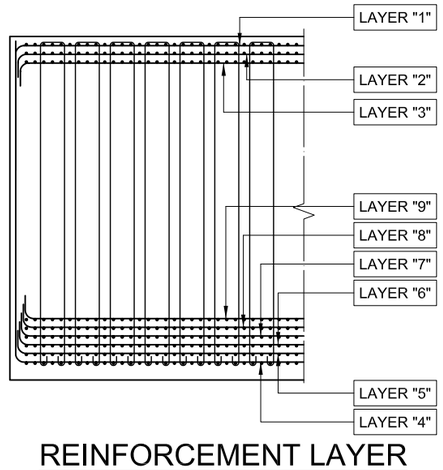
1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
   -PYLON PILE CAP : 40MPa
   -PYLON BASE : 50MPa
3. REINFORCEMENT REBARS SHALL CONFORM TO ASTM A706 GRADE 80(550 MPa) FOR CARBON REBARS(YH).
4. THE STAINLESS STEEL REINFORCEMENT IS RIBBED BARS.
5. MINIMUM CONRETE COVER TO REINFORCEMENT SHALL BE 100mm.
6. FOR VIEW-1 REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32275.
7. FOR SECTION A-A REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32275.
8. FOR SECTION B-B, C-C REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32276.

STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).





REINFORCEMENT LAYER

SCALE : NONE

REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B2	10/09/15	Updated As Shown In Clouds	SWK	HSH	DKK
B1	12/08/15	Updated As Shown In Clouds	SWK	HSH	DKK
A3	17/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	08/04/15	First Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (P3'-M)
REINFORCEMENT ARRANGEMENT 2/7

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED	08/04/15	08/04/15	08/04/15	08/04/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

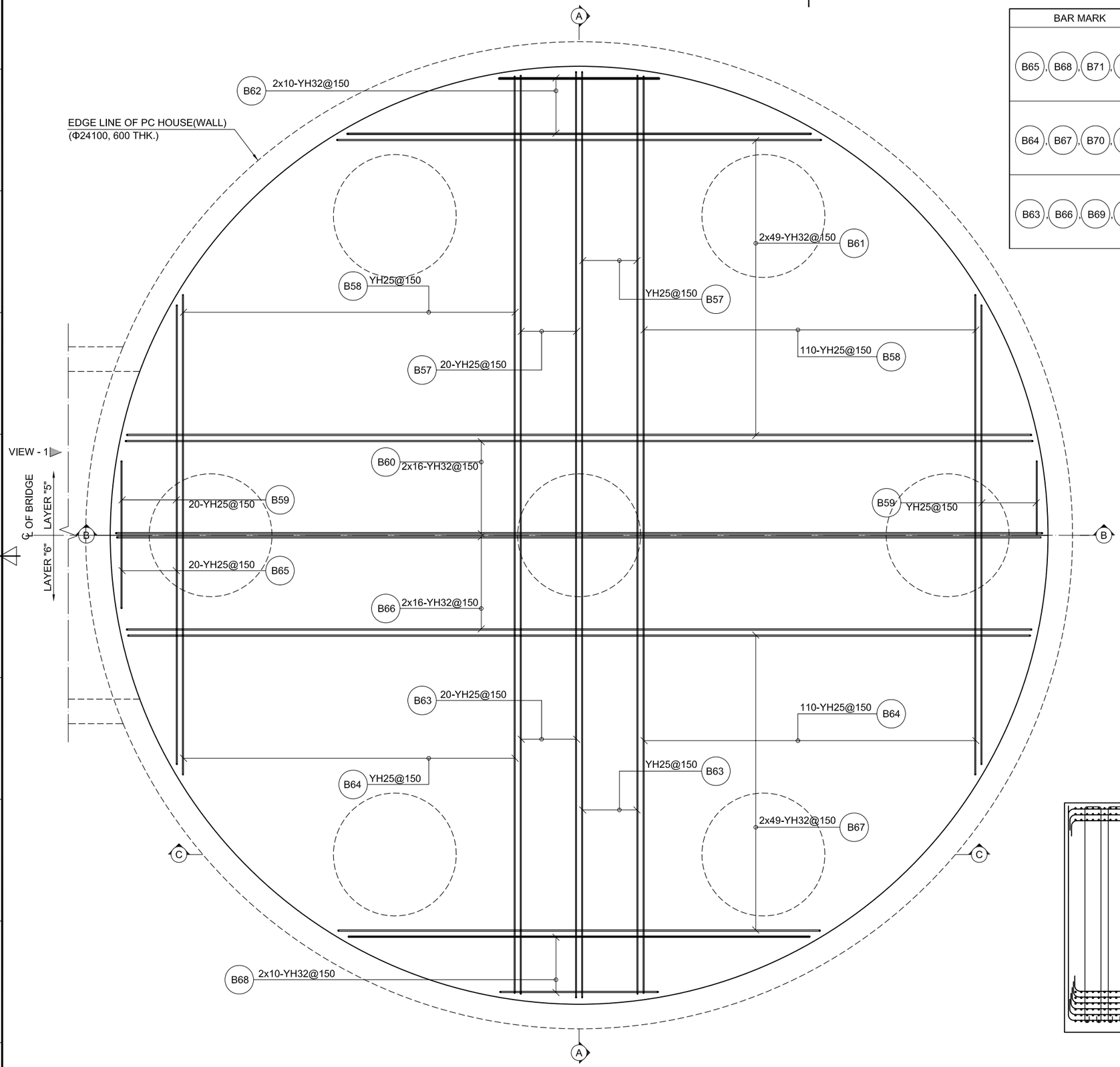
DESIGNER

SYSTRA

DRAWING NO. RA140-22-BRG-CW-DW-32272

REV. B2

A1(594x841mm +2mm)



PLAN VIEW (LAYER "5", "6")

SCALE : 1/50

BAR MARK	BAR SHAPE
B65, B68, B71, B74	
B64, B67, B70, B73	STAGGERED
B63, B66, B69, B72	STAGGERED STAGGERED

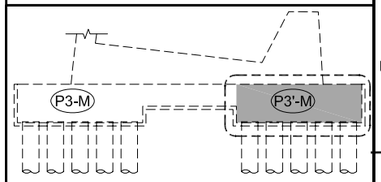
NOTES:

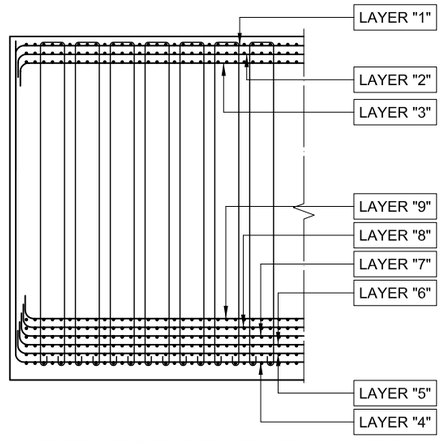
1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
   -PYLON PILE CAP : 40MPa
   -PYLON BASE : 50MPa
3. REINFORCEMENT REBARS SHALL CONFORM TO ASTM A706 GRADE 80(550 MPa) FOR CARBON REBARS(YH).
4. THE STAINLESS STEEL REINFORCEMENT IS RIBBED BARS.
5. MINIMUM CONRETE COVER TO REINFORCEMENT SHALL BE 100mm.
6. FOR VIEW-1 REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32275.
7. FOR SECTION A-A REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32275.
8. FOR SECTION B-B, C-C REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32276.

STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).





REINFORCEMENT LAYER

SCALE : NONE

REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B2	10/09/15	Updated As Shown In Clouds	SWK	HSH	DKK
B1	12/08/15	Updated As Shown In Clouds	SWK	HSH	DKK
A3	17/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	08/04/15	First Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (P3'-M)
REINFORCEMENT ARRANGEMENT 3/7

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED				
08/04/15	08/04/15	08/04/15	08/04/15	08/04/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

DESIGNER

SYSTRA

DRAWING NO. RA140-22-BRG-CW-DW-32273

REV. B2

A1(594x841mm +2mm)

BAR MARK	BAR SHAPE
B71 , B74 , B82 , B88	
B70 , B73 , B81 , B87	STAGGERED
B69 , B72 , B80 , B86	STAGGERED STAGGERED

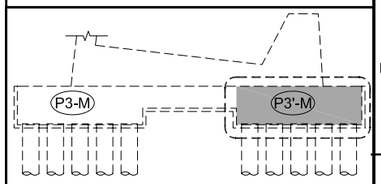
NOTES:

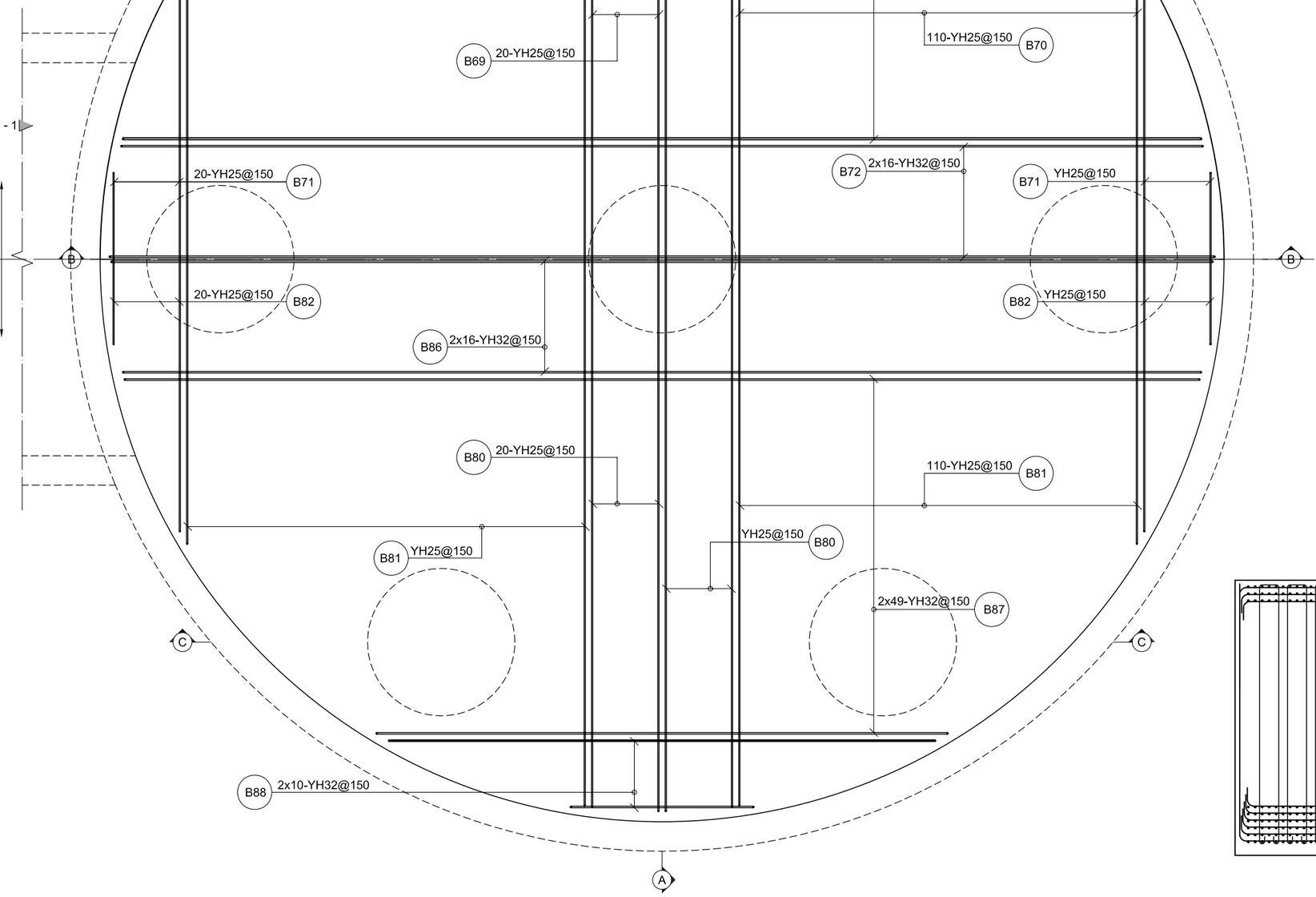
1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
   -PYLON PILE CAP : 40MPa
   -PYLON BASE : 50MPa
3. REINFORCEMENT REBARS SHALL CONFORM TO ASTM A706 GRADE 80(550 MPa) FOR CARBON REBARS(YH).
4. THE STAINLESS STEEL REINFORCEMENT IS RIBBED BARS.
5. MINIMUM CONRETE COVER TO REINFORCEMENT SHALL BE 100mm.
6. FOR VIEW-1 REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32275.
7. FOR SECTION A-A REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32275.
8. FOR SECTION B-B, C-C REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32276.

STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

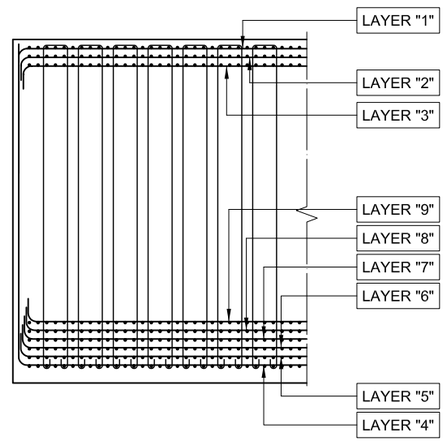
HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).





PLAN VIEW(LAYER "7", "8")

SCALE : 1/50



REINFORCEMENT LAYER

SCALE : NONE

REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B2	10/09/15	Updated As Shown In Clouds	SWK	HSH	DKK
B1	12/08/15	Updated As Shown In Clouds	SWK	HSH	DKK
A3	17/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	08/04/15	First Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (P3'-M)
REINFORCEMENT ARRANGEMENT 4/7

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED				
08/04/15	08/04/15	08/04/15	08/04/15	08/04/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

DESIGNER

SYSTRA

DRAWING NO. RA140-22-BRG-CW-DW-32274

REV. B2

A1(594x841mm +2mm)

BAR MARK	BAR SHAPE
B93 , B98	
B92 , B97	STAGGERED
B91 , B96	STAGGERED STAGGERED

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
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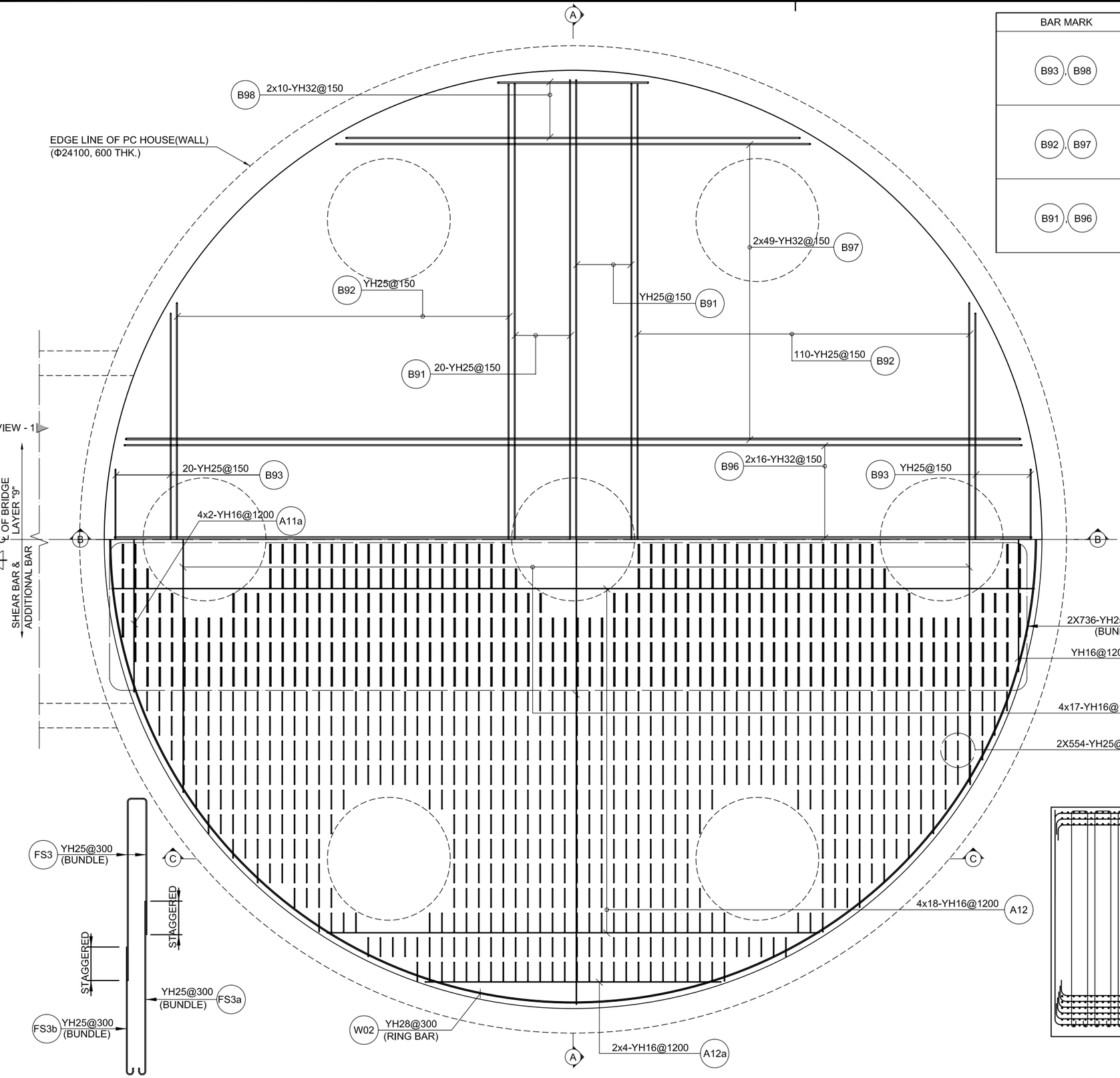
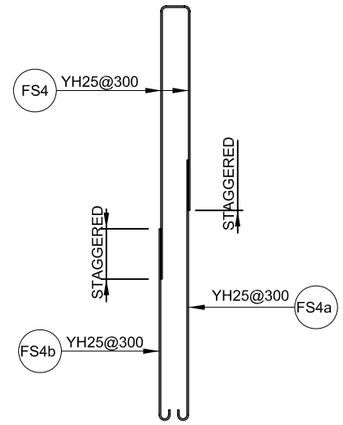
8. FOR SECTION B-B, C-C REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32276.



PLAN VIEW(LAYER "9" & SHEAR BAR)

SCALE : 1/50

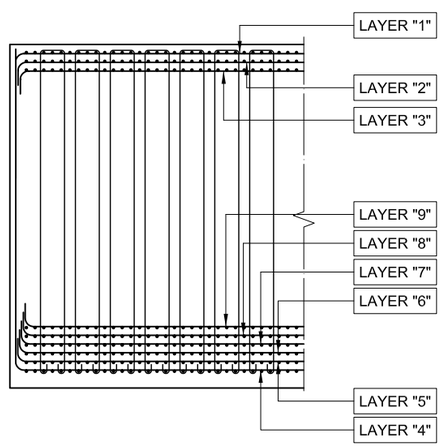


SHEAR BAR(TYPE-2)

SCALE : 1/50

SHEAR BAR(TYPE-1)

SCALE : 1/50



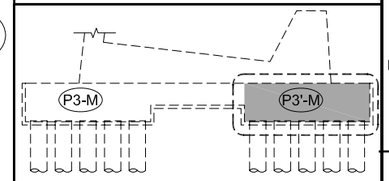
REINFORCEMENT LAYER

SCALE : NONE

STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).



REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B1	10/09/15	First Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (P3'-M)
REINFORCEMENT ARRANGEMENT 5/7

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED				
10/09/15	10/09/15	10/09/15	10/09/15	10/09/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

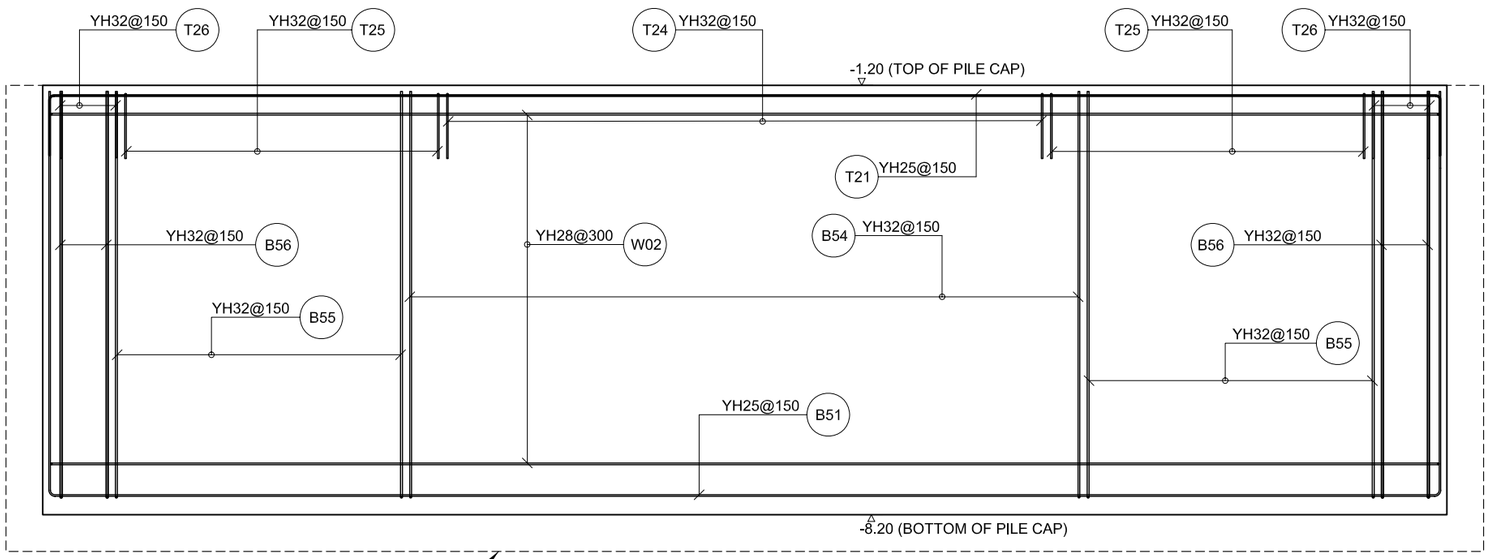
DESIGNER

SYSTRA

DRAWING NO. RA140-22-BRG-CW-DW-32279

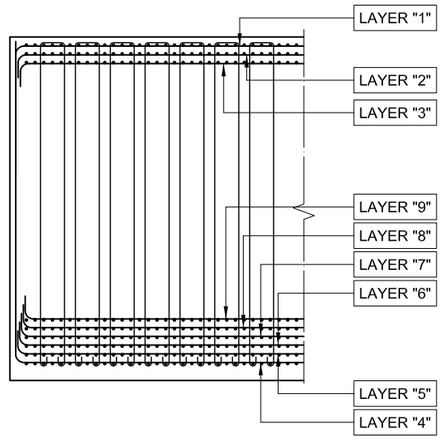
REV. B1

A1(594x841mm +2mm)



VIEW - 1

SCALE : 1/50



REINFORCEMENT LAYER

SCALE : NONE

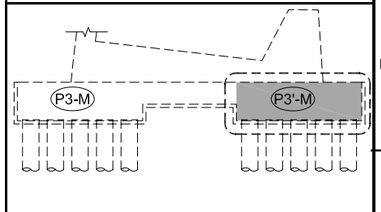
NOTES:

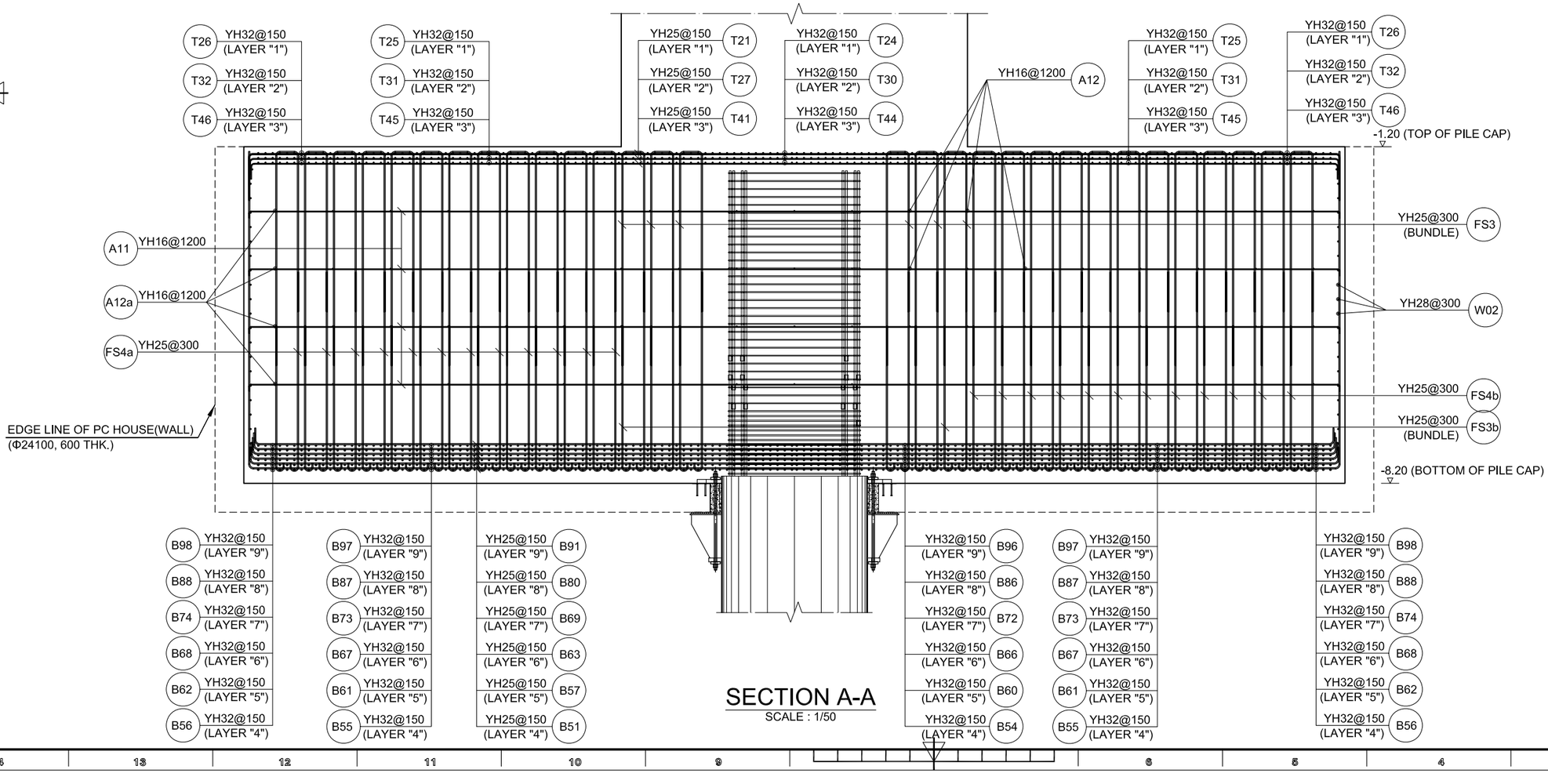
1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
   -PYLON PILE CAP : 40MPa
   -PYLON BASE : 50MPa
3. REINFORCEMENT REBARS SHALL CONFORM TO ASTM A706 GRADE 80(550 MPa) FOR CARBON REBARS(YH).
4. THE STAINLESS STEEL REINFORCEMENT IS RIBBED BARS.
5. MINIMUM CONRETE COVER TO REINFORCEMENT SHALL BE 100mm.
6. FOR VIEW-1 REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32271 TO 32274.
7. FOR SECTION A-A REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32271 TO 32274.

STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).





SECTION A-A

SCALE : 1/50

REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B2	10/09/15	Updated As Shown In Clouds	SWK	HSH	DKK
B1	12/08/15	Updated As Shown In Clouds	SWK	HSH	DKK
A3	17/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	08/04/15	FIrst Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (P3'-M)
REINFORCEMENT ARRANGEMENT 6/7

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED	08/04/15	08/04/15	08/04/15	08/04/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

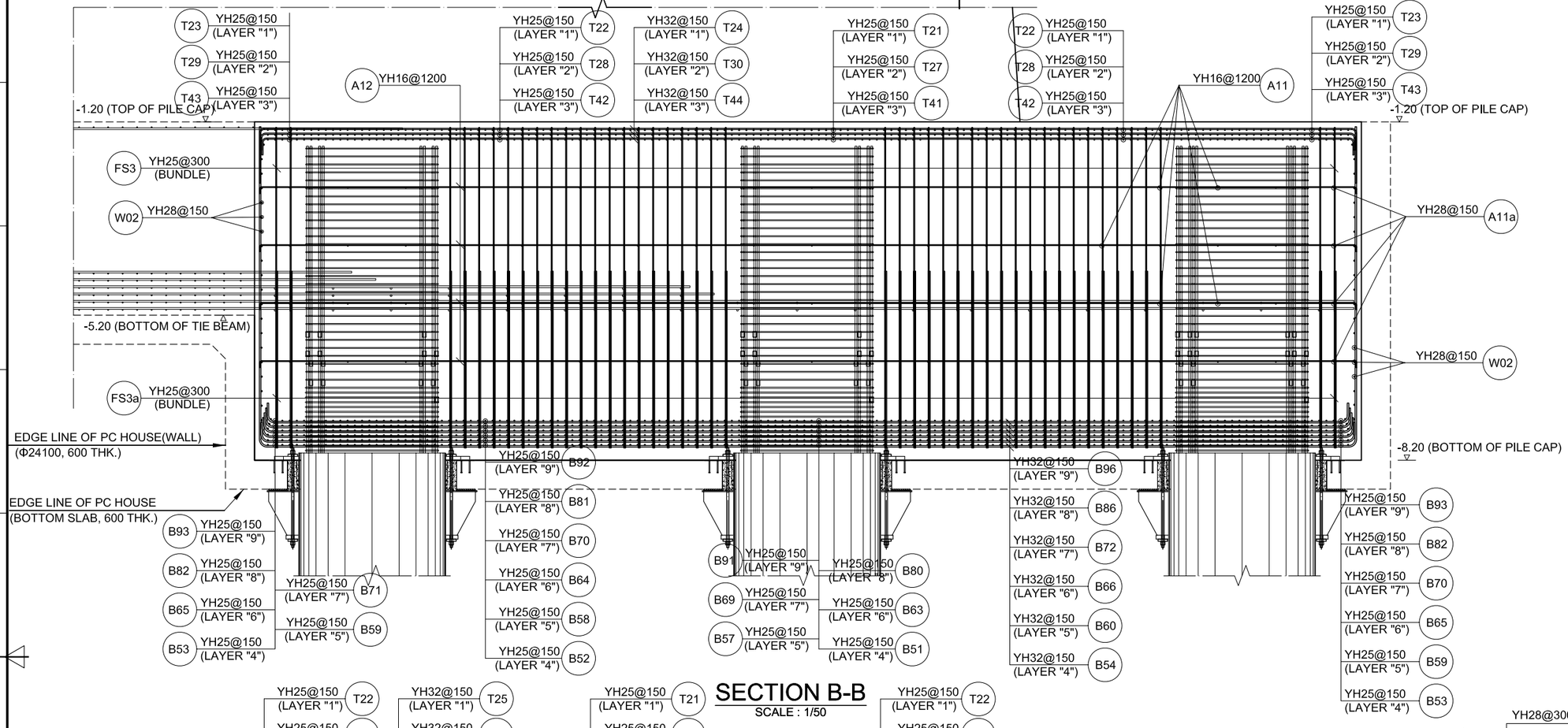
DESIGNER

SYSTRA

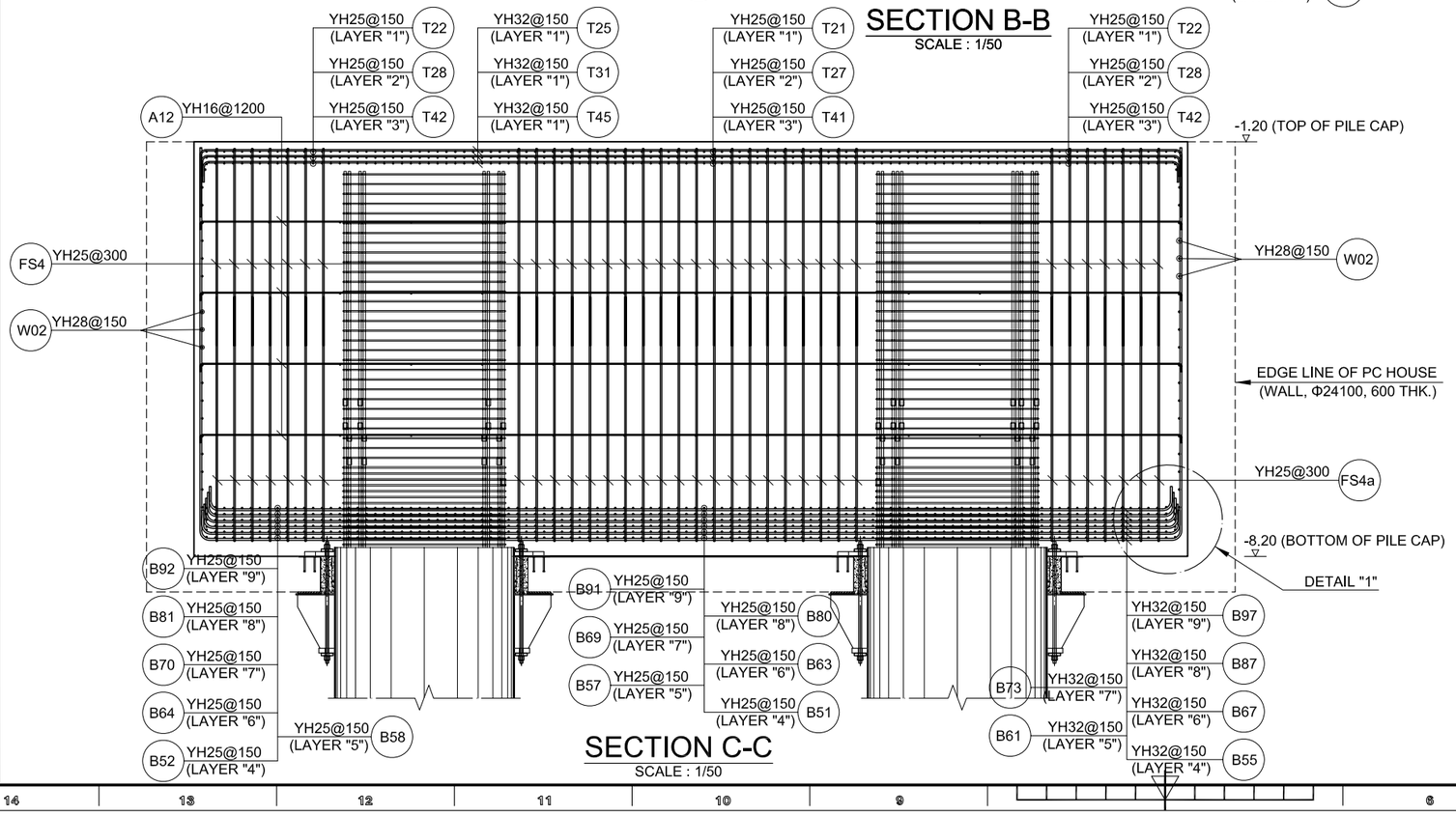
DRAWING NO. RA140-22-BRG-CW-DW-32275

REV. B2

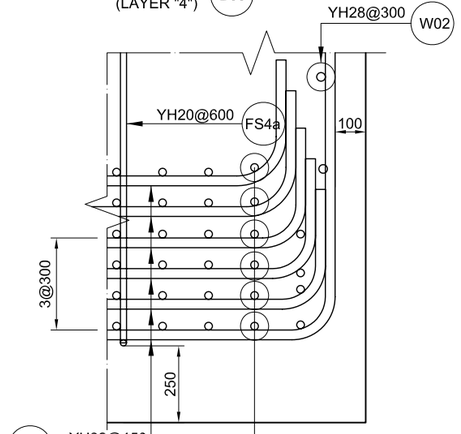
A1(594x841mm +2mm)



SECTION B-B
SCALE : 1/50



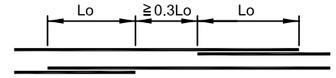
SECTION C-C
SCALE : 1/50



DETAIL "1"
SCALE : 1/10

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
   -PYLON PILE CAP : 40MPa
   -PYLON BASE : 50MPa
3. REINFORCEMENT REBARS SHALL CONFORM TO ASTM A706 GRADE 80(550 MPa) FOR CARBON REBARS(YH).
4. THE STAINLESS STEEL REINFORCEMENT IS RIBBED BARS.
5. MINIMUM CONRETE COVER TO REINFORCEMENT SHALL BE 100mm.
6. FOR SECTION B-B, C-C REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32271 TO 32274.
7. THE LONGITUDINAL DISTANCE BETWEEN TWO ADJACENT LAPS SHOULD NOT BE LESS THAN 0.3Lo(LAP LENGTH).

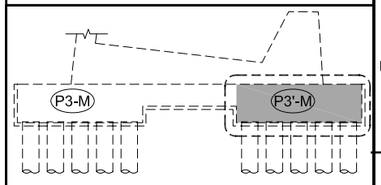


STAINLESS STEEL REINFORCEMENT SHALL AS

A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).



REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B2	10/09/15	Updated As Shown In Clouds	SWK	HSH	DKK
B1	12/08/15	Updated As Shown In Clouds	SWK	HSH	DKK
A4	17/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	08/04/15	First Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (P3'-M)
REINFORCEMENT ARRANGEMENT 7/7

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED				
08/04/15	08/04/15	08/04/15	08/04/15	08/04/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

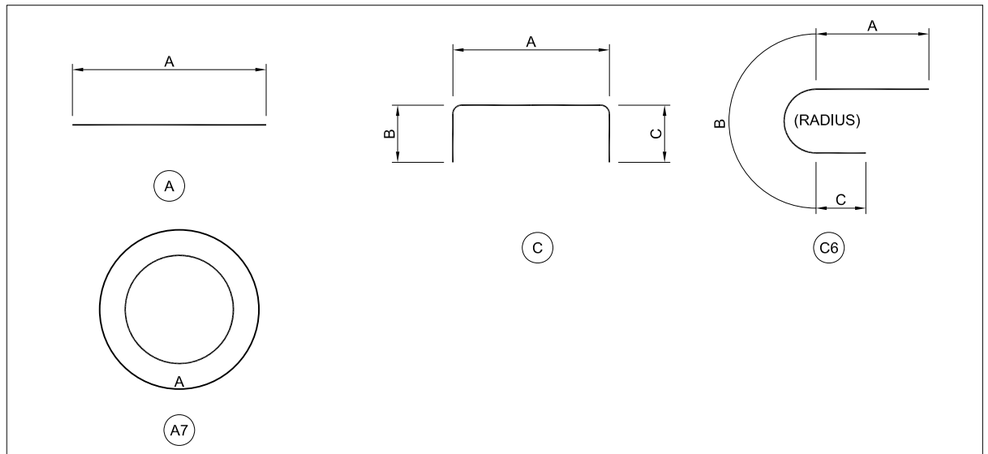
DESIGNER

SYSTRA

DRAWING NO. RA140-22-BRG-CW-DW-32276

REV. B2

A1(594x841mm +2mm)



REINFORCING BAR DATA

DIAMETER		YH10	YH12	YH14	YH16	YH18	YH20	YH22	YH25	YH28	YH32	YH36	YH40	UNITS
UNIT WEIGHT		0.617	0.888	1.210	1.580	1.994	2.470	2.983	3.850	4.840	6.310	7.991	9.860	kg / m
LAP LENGTH (fy=550Mpa)	TYPICAL	410	495	575	660	740	820	905	1,050	1,345	1,730	2,200	2,720	mm
	TOP BAR	570	685	800	915	1,030	1,140	1,255	1,475	1,850	2,435	3,060	3,800	mm

CALCULATIONS

MARKS	DIA.	SHAPE	NOS	REINFORCING BAR DIMENSION (mm)									LAP SPLICE (mm)		LENGTH (m)	WEIGHT (kg)
				A	B	C	D	E	F	G	H	I	LENGTH	NUMBER		
T21	YH25	C	56	20,497	1,730	1,730							1,140	2	1,469	5,657
T22	YH25	C	80	13,573	1,730	1,730							1,140	1	1,454	5,597
T23	YH25	C	14	6,232	1,730	1,730									136	522
T24	YH32	C	66	20,448	1,730	1,730							1,475	2	1,773	11,185
T25	YH32	C	70	13,471	1,730	1,730							1,475	1	1,288	8,130
T26	YH32	C	14	6,060	1,730	1,730									133	841
T27	YH25	C	24	21,888	250	250							1,140	1	565	2,174
T28	YH25	C	106	16,378	250	250							1,140	1	1,910	7,353
T29	YH25	C	20	7,498	250	250									160	616
T30	YH32	C	36	21,890	250	250							1,475	1	859	5,421
T31	YH32	C	94	16,393	250	250							1,475	1	1,727	10,895
T32	YH32	C	20	7,384	250	250									158	995
T41	YH25	C	24	21,888	250	250							1,140	1	565	2,174
T42	YH25	C	106	16,378	250	250							1,140	1	1,910	7,353
T43	YH25	C	20	7,498	250	250									160	616
T44	YH32	C	36	21,890	250	250							1,475	1	859	5,421
T45	YH32	C	94	16,393	250	250							1,475	1	1,727	10,895
T46	YH32	C	20	7,384	250	250									158	995
B51	YH25	C	66	21,452	6,630	6,630							1,050	3	2,499	9,621
B52	YH25	C	72	14,908	6,630	6,630							1,050	2	2,179	8,390
B53	YH25	C	12	6,705	6,630	6,630							1,050	1	252	971
B54	YH32	C	74	21,033	6,630	6,630							1,345	3	2,836	17,897
B55	YH32	C	64	14,097	6,630	6,630							1,345	2	1,923	12,134
B56	YH32	C	12	6,178	6,630	6,630							1,345	1	249	1,574
B57	YH25	C	20	22,408	250	250							1,050	1	479	1,845
B58	YH25	C	110	33,482	250	250							1,050	3	4,085	15,725

MARKS	DIA.	SHAPE	NOS	REINFORCING BAR DIMENSION (mm)						LAP SPLICE (mm)		HOOK (NOS)			LENGTH (m)	WEIGHT (kg)
				A	B	C	D	E	F	LENGTH	NUMBER	90°	135°	180°		
B59	YH25	C	20	7,620	250	250									162	625
B60	YH32	C	32	22,211	250	250							1,345	2	813	5,129
B61	YH32	C	98	16,737	250	250							1,345	1	1,821	11,491
B62	YH32	C	20	6,980	250	250									150	944
B63	YH25	C	20	22,382	250	250							1,050	1	479	1,843
B64	YH25	C	110	16,884	250	250							1,050	1	2,028	7,807
B65	YH25	C	20	7,399	250	250									158	608
B66	YH32	C	32	22,187	250	250							1,345	2	812	5,124
B67	YH32	C	98	16,686	250	250							1,345	1	1,816	11,459
B68	YH32	C	20	7,208	250	250									154	973
B69	YH25	C	20	22,428	250	250							1,050	1	480	1,846
B70	YH25	C	110	16,967	250	250							1,050	1	2,037	7,842
B71	YH25	C	20	7,320	250	250									156	602
B72	YH32	C	32	22,268	250	250							1,345	2	815	5,140
B73	YH32	C	98	16,835	250	250							1,345	1	1,831	11,551
B74	YH32	C	20	7,496	250	250									160	1,009
B80	YH25	C	20	22,410	250	250							1,050	1	479	1,845
B81	YH25	C	110	16,949	250	250							1,050	1	2,035	7,834
B82	YH25	C	20	7,301	250	250									156	601
B86	YH32	C	32	22,208	250	250							1,345	2	813	5,128
B87	YH32	C	98	16,775	250	250							1,345	1	1,825	11,514
B88	YH32	C	20	7,436	250	250									159	1,002
B91	YH25	C	20	22,360	250	250							1,050	1	478	1,841
B92	YH25	C	110	16,899	250	250							1,050	1	2,029	7,813
B93	YH25	C	20	7,251	250	250									155	597
B96	YH32	C	32	22,144	250	250							1,345	1	768	4,844
B97	YH32	C	98	16,711	250	250							1,345	1	1,818	11,475
B98	YH32	C	20	7,372	250	250									157	993
W02	YH28	A7	20	71,138									1,345	6	1,584	7,667
A11	YH16	C	68	18,440	100	100							660	1	1,312	2,074
A12	YH16	C	72	17,653	100	100							660	1	1,333	2,106
A11a	YH16	C	8	8,973	100	100									73	116
A12a	YH16	C	8	8,973	100	100									73	116
FS3	YH25	C	1,472	472	4,450	3,330									12,147	46,766
FS3a	YH25	C6	1,472	4,018	220	80									6,356	24,471
FS3b	YH25	C6	1,472	2,898	220	80									4,707	18,124
FS4	YH25	C	1,108	472	4,450	3,330									9,143	35,201
FS4a	YH25	C6	1,108	4,018	220	80									4,784	18,420
FS4b	YH25	C6	1,108	2,898	220	80									3,543	13,642
TOTAL WEIGHT (kg)																453,179
TOTAL WEIGHT (TON)																453.179

QUANTITY TABLE OF REINFORCING BAR

SCALE : NONE

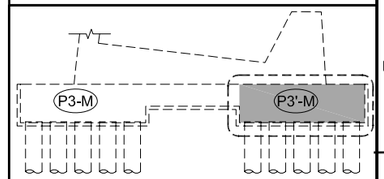
NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
   -PYLON PILE CAP : 40MPa
   -PYLON BASE : 50MPa
3. REINFORCEMENT REBARS SHALL CONFORM TO ASTM A706 GRADE 80(550 MPa) FOR CARBON REBARS(YH).
4. THE STAINLESS STEEL REINFORCEMENT IS RIBBED BARS.
5. MINIMUM CONRETE COVER TO REINFORCEMENT SHALL BE 100mm.

STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).



REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B2	10/09/15	Updated As Shown In Clouds	SWK	HSH	DKK
B1	12/08/15	Updated As Shown In Clouds	SWK	HSH	DKK
A4	17/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	08/04/15	First Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (TIE BEAM)
BAR LIST

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED				
08/04/15	08/04/15	08/04/15	08/04/15	08/04/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

DESIGNER

SYSTRA

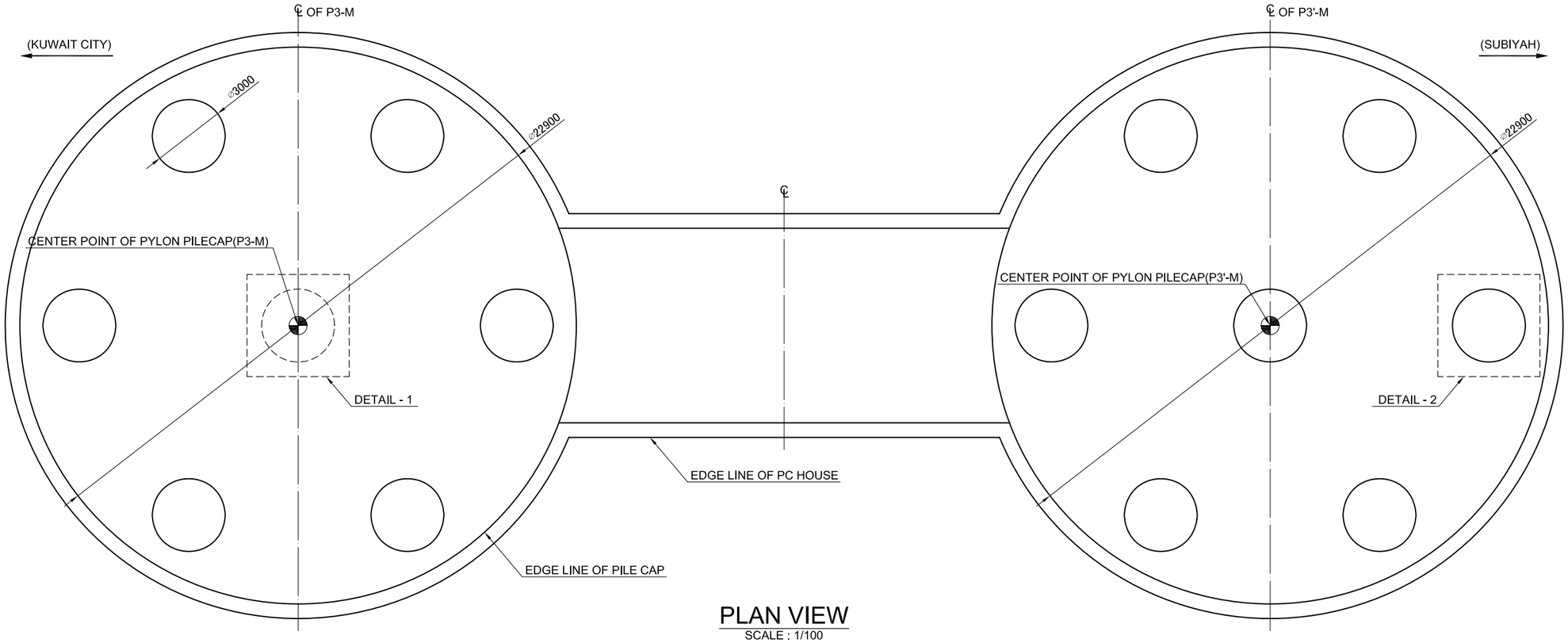
DRAWING NO.

RA140-22-BRG-CW-BS-32277

REV.

B2

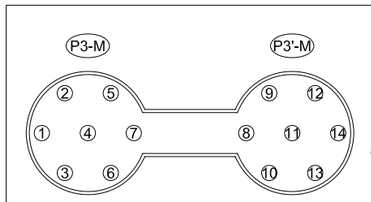
A1(594x841mm +-2mm)

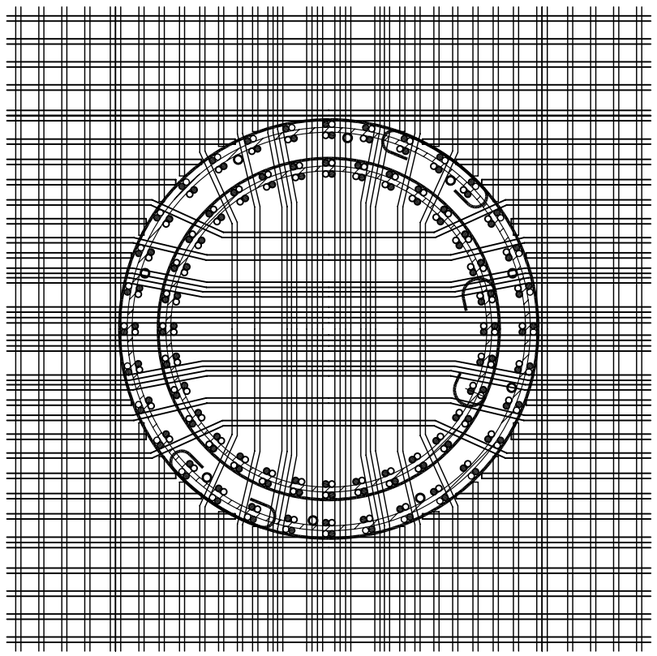


PLAN VIEW
SCALE : 1/100

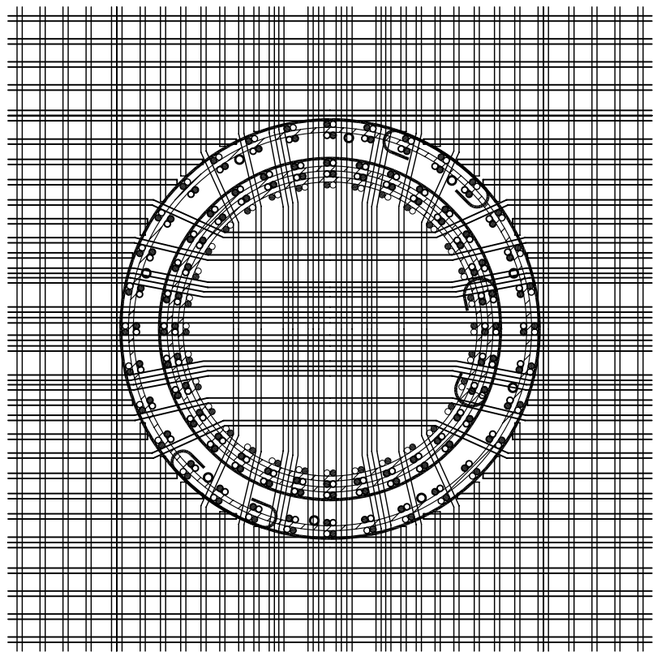
NOTES:

1. THIS DRAWING IS A SCHEME DRAWING FOR SHOP DRAWING PRIOR TO CONSTRUCTION.

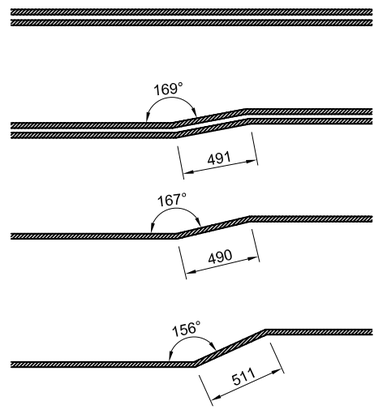




DETAIL - 1 (PILE NO.1 TO NO.11)
SCALE : 1/20



DETAIL - 2 (PILE NO.12 TO NO.14)
SCALE : 1/20



BAR BENDING DETAIL
SCALE : 1/20

REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B1	12/08/15	FIrst Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON
SCHEME FOR AVOIDING REBAR CONFLICT

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED				
12/08/15	12/08/15	12/08/15	12/08/15	12/08/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

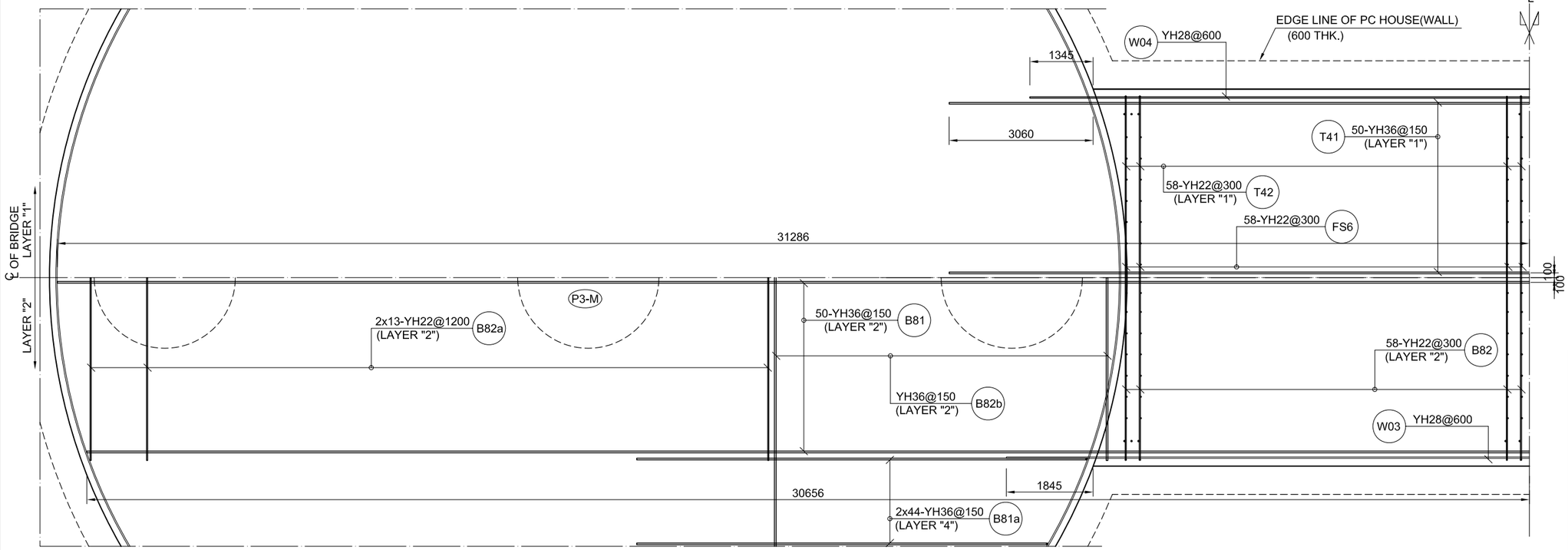
DESIGNER

SYSTRA

DRAWING NO. RA140-22-BRG-CW-DW-32278

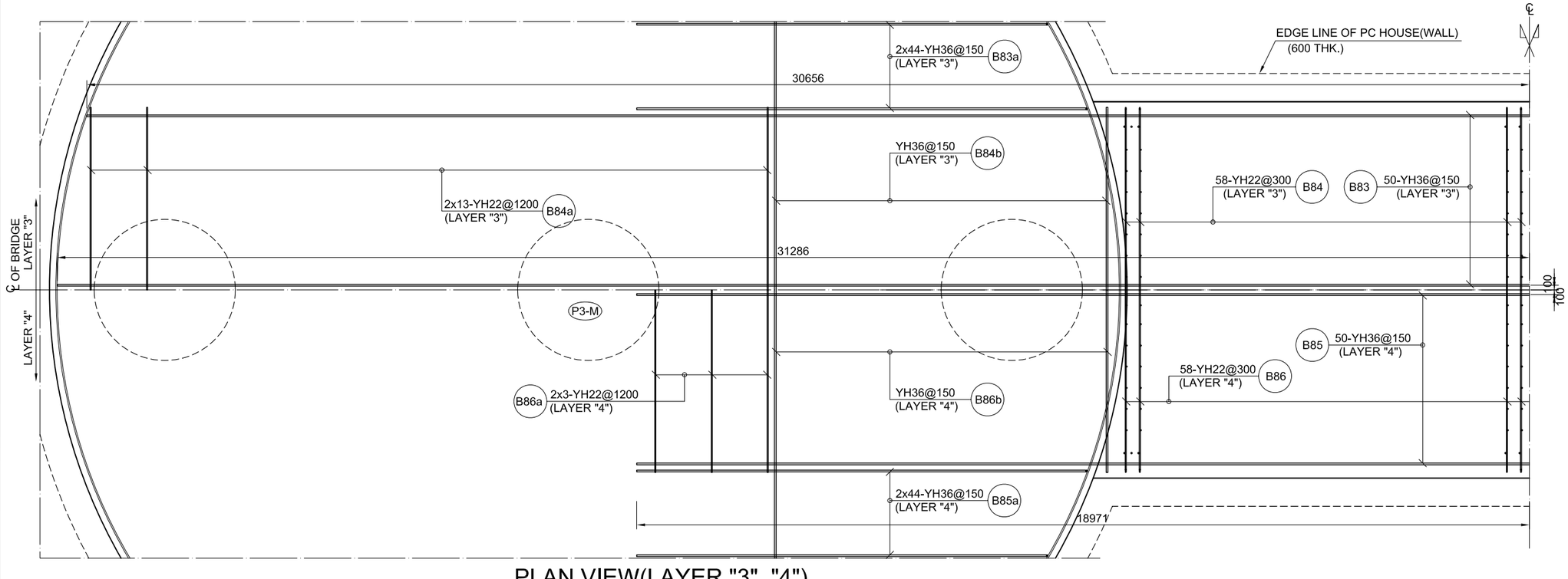
REV. B1

A1(594x841mm +2mm)



PLAN VIEW(LAYER "1", "2")

SCALE : 1/50

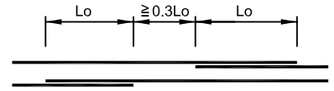


PLAN VIEW(LAYER "3", "4")

SCALE : 1/50

NOTES:

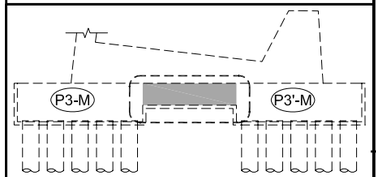
1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
   -PYLON PILE CAP : 40MPa
   -PYLON BASE : 50MPa
3. REINFORCEMENT REBARS SHALL CONFORM TO ASTM A706 GRADE 80(550 MPa) FOR CARBON REBARS(YH).
4. THE STAINLESS STEEL REINFORCEMENT IS RIBBED BARS.
5. MINIMUM CONRETE COVER TO REINFORCEMENT SHALL BE 100mm.
6. THE LONGITUDINAL DISTANCE BETWEEN TWO ADJACENT LAPS SHOULD NOT BE LESS THAN 0.3Lo(LAP LENGTH)



STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).



REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B2	10/09/15	Updated As Shown In Clouds	SWK	HSH	DKK
B1	12/08/15	Updated As Shown In Clouds	SWK	HSH	DKK
A5	20/07/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	08/04/15	First Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON(TIE BEAM)
REINFORCEMENT ARRANGEMENT 1/3

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED				
08/04/15	08/04/15	08/04/15	08/04/15	08/04/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

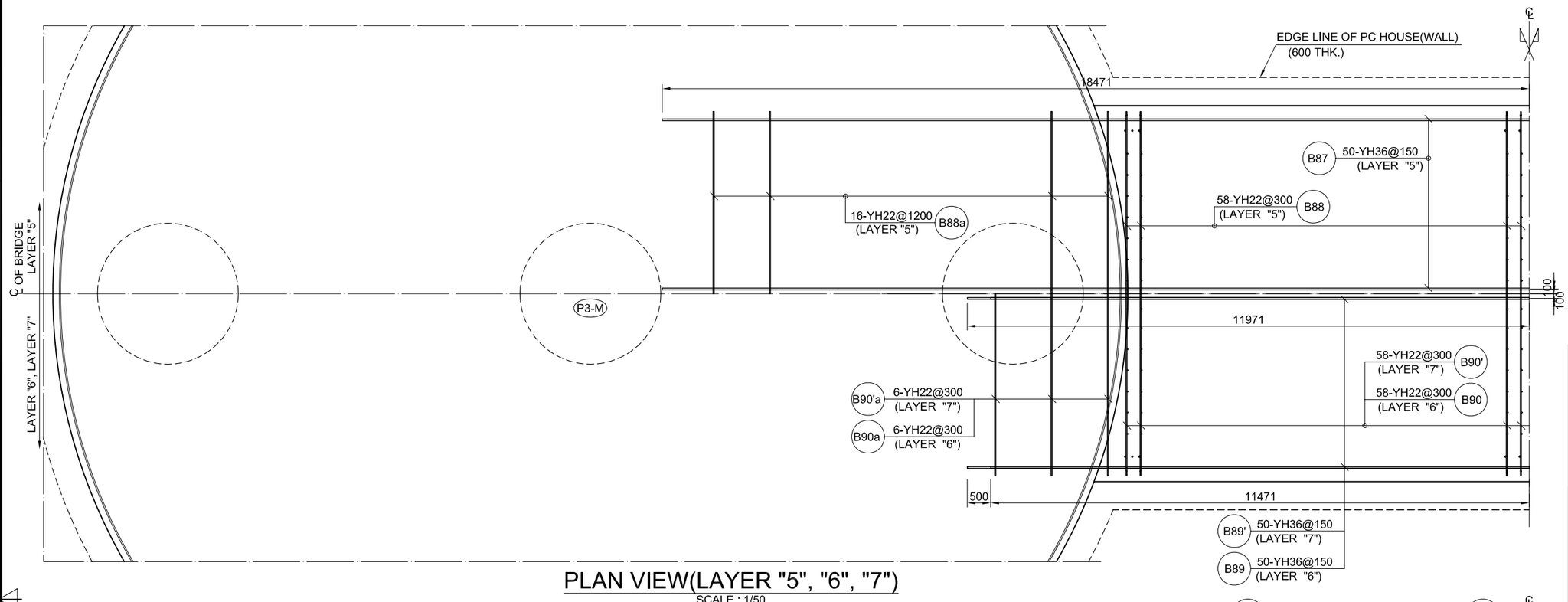
DESIGNER

SYSTRA

DRAWING NO. RA140-22-BRG-CW-DW-32281

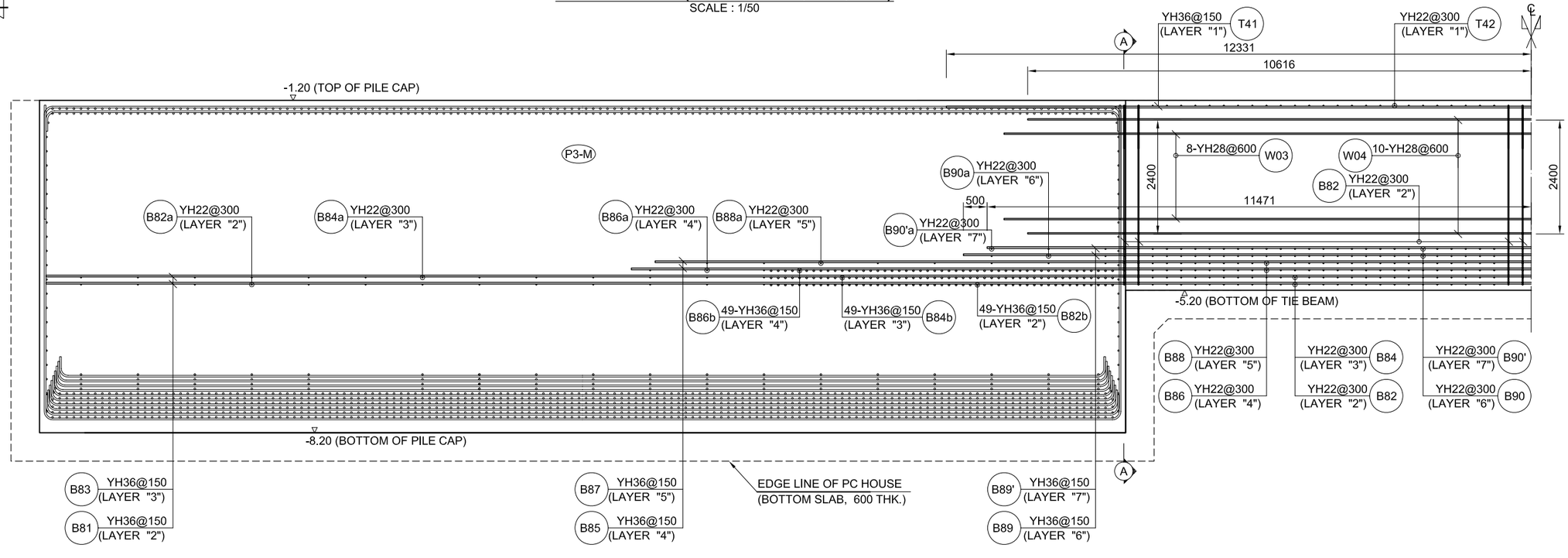
REV. B2

A1(594x841mm +2mm) _



PLAN VIEW(LAYER "5", "6", "7")

SCALE : 1/50



VIEW - 1

SCALE : 1/50

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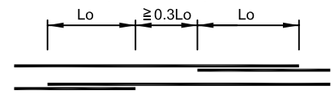
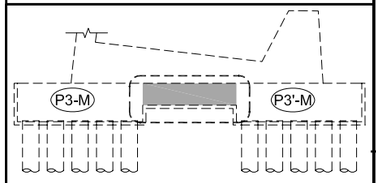
5. MINIMUM CONRETE COVER TO REINFORCEMENT SHALL BE 100mm.
6. FOR SECTION A-A REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32283.
7. THE LONGITUDINAL DISTANCE BETWEEN TWO ADJACENT LAPS SHOULD NOT BE LESS THAN 0.3Lo(LAP LENGTH)



STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).



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A1	08/04/15	First Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON(TIE BEAM)
REINFORCEMENT ARRANGEMENT 2/3

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED				
08/04/15	08/04/15	08/04/15	08/04/15	08/04/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

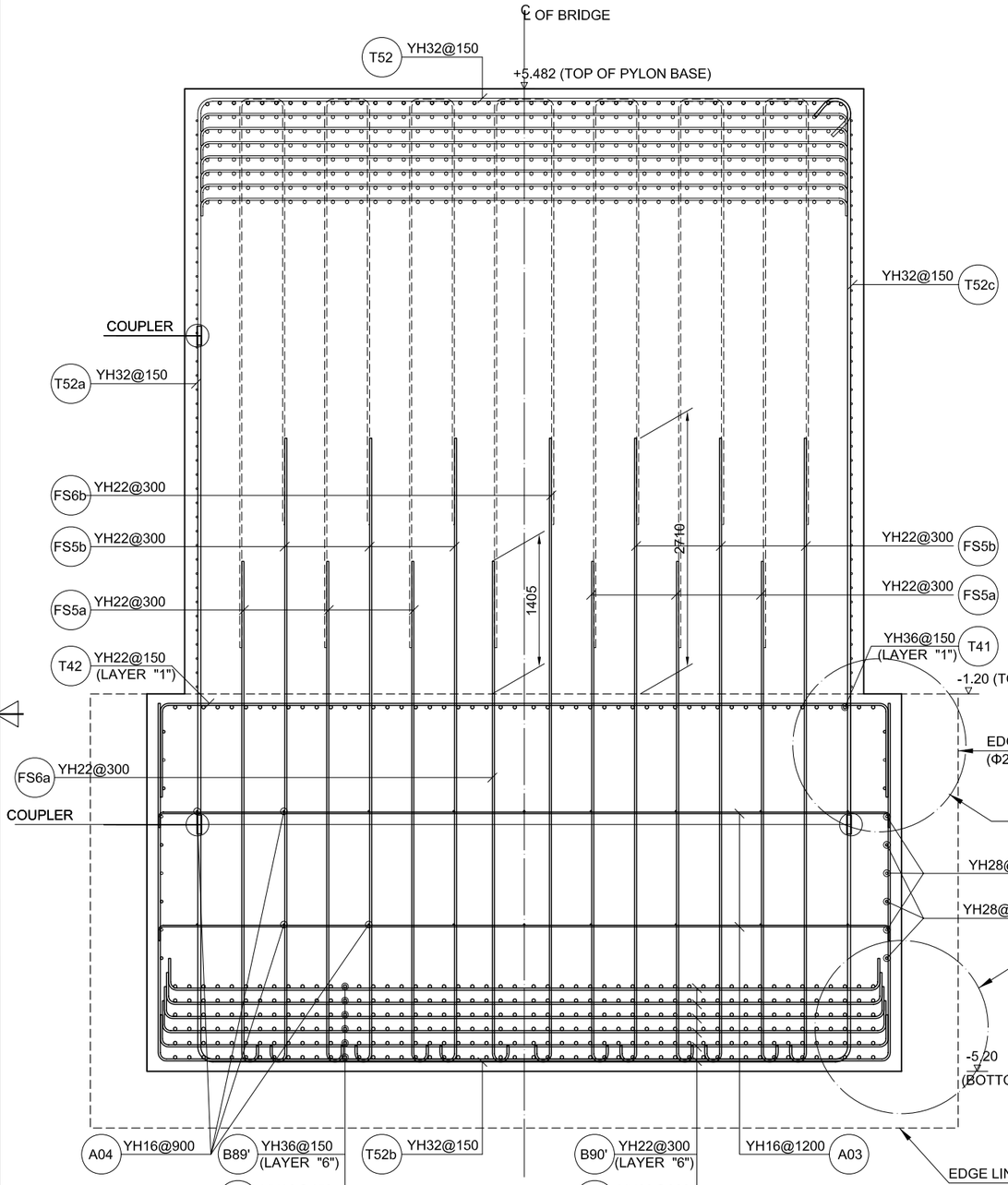
DESIGNER

SYSTRA

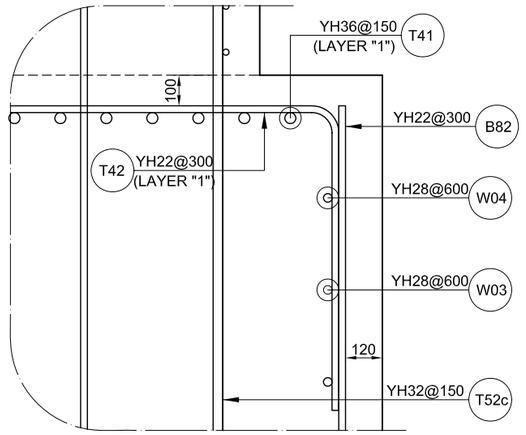
DRAWING NO. RA140-22-BRG-CW-DW-32282

REV. B2

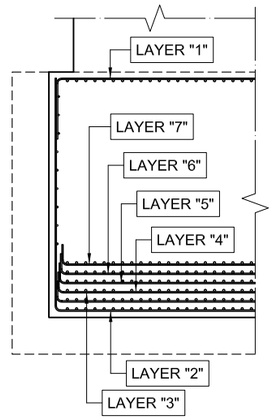
A1(594x841mm +2mm)



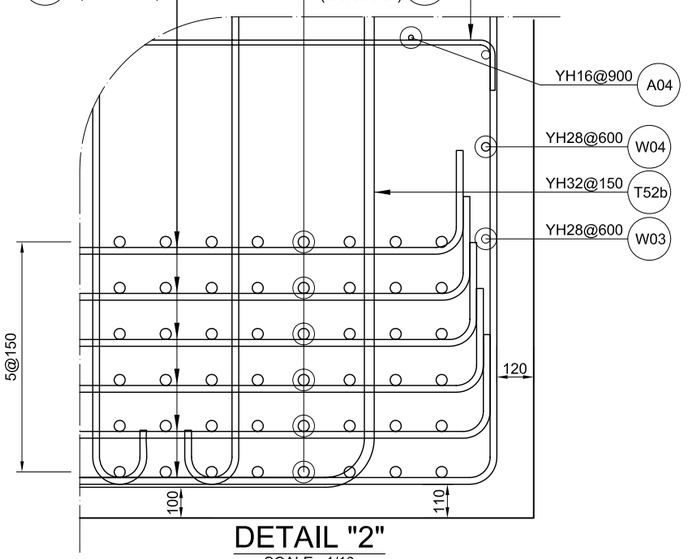
SECTION A-A
SCALE : 1/30



DETAIL "1"
SCALE : 1/10



REINFORCEMENT LAYER
SCALE : NONE



DETAIL "2"
SCALE : 1/10

NOTES:

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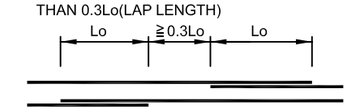
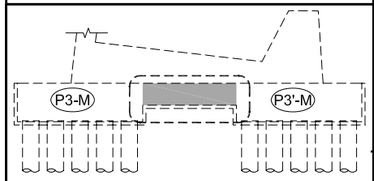


STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).



REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
A5	20/07/15	Updated As Shown In Clouds	SWK	HSH	DKK
A4	17/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A3	05/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	08/04/15	First Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON(TIE BEAM)
REINFORCEMENT ARRANGEMENT 3/3

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED	08/04/15	08/04/15	08/04/15	08/04/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

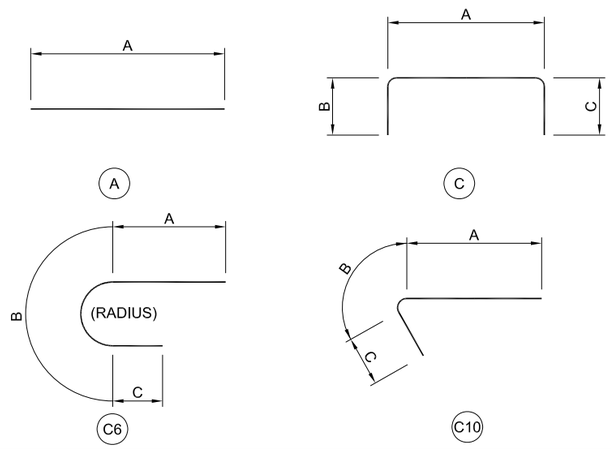
DESIGNER

SYSTRA

DRAWING NO. RA140-22-BRG-CW-DW-32283

REV. A5

A1(594x841mm +2mm)



REINFORCING BAR DATA														
DIAMETER		YH10	YH12	YH14	YH16	YH18	YH20	YH22	YH25	YH28	YH32	YH36	YH40	UNITS
UNIT WEIGHT		0.617	0.888	1.210	1.580	1.994	2.470	2.983	3.850	4.840	6.310	7.991	9.860	kg / m
LAP LENGTH (fy=550Mpa)	TYPICAL	410	495	575	660	740	820	905	1,050	1,345	1,730	2,200	2,720	mm
	TOP BAR	570	685	800	915	1,030	1,140	1,255	1,475	1,850	2,435	3,060	3,800	mm

CALCULATIONS

MARKS	DIA.	SHAPE	NOS	REINFORCING BAR DIMENSION (mm)									LAP SPLICE (mm)		LENGTH (m)	WEIGHT (kg)
				A	B	C	D	E	F	G	H	I	LENGTH	NUMBER		
T41	Y36	A	50	24,663									3,060	2	1,539	12,299
T42	Y22	C	58	7,756	993	993									565	1,686
B81	Y36	A	50	62,572									2,200	6	3,789	30,275
B81a	Y36	C	88	9,161	250	250									850	6,793
B82	Y22	C	58	7,800	3,800	3,800							905	1	946	2,821
B82b	Y36	A	49	9,583											470	3,752
B83	Y36	A	50	62,572									2,200	6	3,789	30,275
B83a	Y36	C	88	9,161	250	250									850	6,793
B84	Y22	C	58	7,756	250	250									479	1,428
B84b	Y36	A	49	9,583											470	3,752
B85	Y36	A	50	37,942									2,200	3	2,227	17,797
B85a	Y36	C	88	9,161	250	250									850	6,793
B86	Y22	C	58	7,712	250	250									476	1,421
B86b	Y36	A	49	9,583											470	3,752
B87	Y36	A	50	36,942									2,200	3	2,177	17,397
B88	Y22	C	58	7,668	250	250									474	1,413
B89	Y36	A	50	23,943									2,200	2	1,417	11,324
B90	Y22	C	58	7,712	250	250									476	1,421
B89'	Y36	A	50	22,943									2,200	2	1,367	10,925
B90'	Y22	C	58	7,668	250	250									474	1,413

QUANTITY TABLE OF REINFORCING BAR
SCALE : NONE

MARKS	DIA.	SHAPE	NOS	REINFORCING BAR DIMENSION (mm)									LAP SPLICE (mm)		LENGTH (m)	WEIGHT (kg)
				A	B	C	D	E	F	G	H	I	LENGTH	NUMBER		
B82a	Y22	A	26	7,760											202	602
B84a	Y22	A	26	7,760											202	602
B86a	Y22	A	6	7,760											47	139
B88a	Y22	A	16	7,760											124	370
B90a	Y22	A	6	7,760											47	139
B90'a	Y22	A	6	7,760											47	139
W03	Y28	A	8	22,233									1,345	1	189	913
W04	Y28	A	10	21,233									1,345	1	226	1,093
A03	Y16	C	30	7,788	164	164									243	385
A04	Y16	A	18	19,643									660	1	365	577
T52a	Y32	A	116	4,302											499	3,149
T52b	Y32	C	116	6,928	2,500	2,500									1,384	8,731
T52c	Y32	C10	116	6,801	339	192									850	5,366
FS5a	Y22	C6	348	5,217	276	88									1,942	5,794
FS5b	Y22	C6	348	6,522	276	88									2,396	7,148
FS6a	Y22	C6	58	5,217	276	88									324	966
FS6b	Y22	C6	58	6,522	276	88									399	1,191
TOTAL WEIGHT (kg)																210,835
TOTAL WEIGHT (TON)																210.835

No.	COUNT	REMARKS
YH32	348	

COUPLER DETAIL
SCALE : NONE

NOTES:

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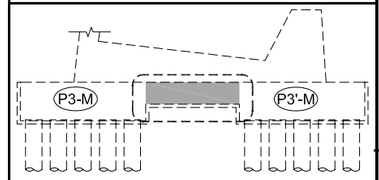
FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).



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EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (TIE BEAM)
BAR LIST

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED				
08/04/15	08/04/15	08/04/15	08/04/15	08/04/15

CONTRACTOR

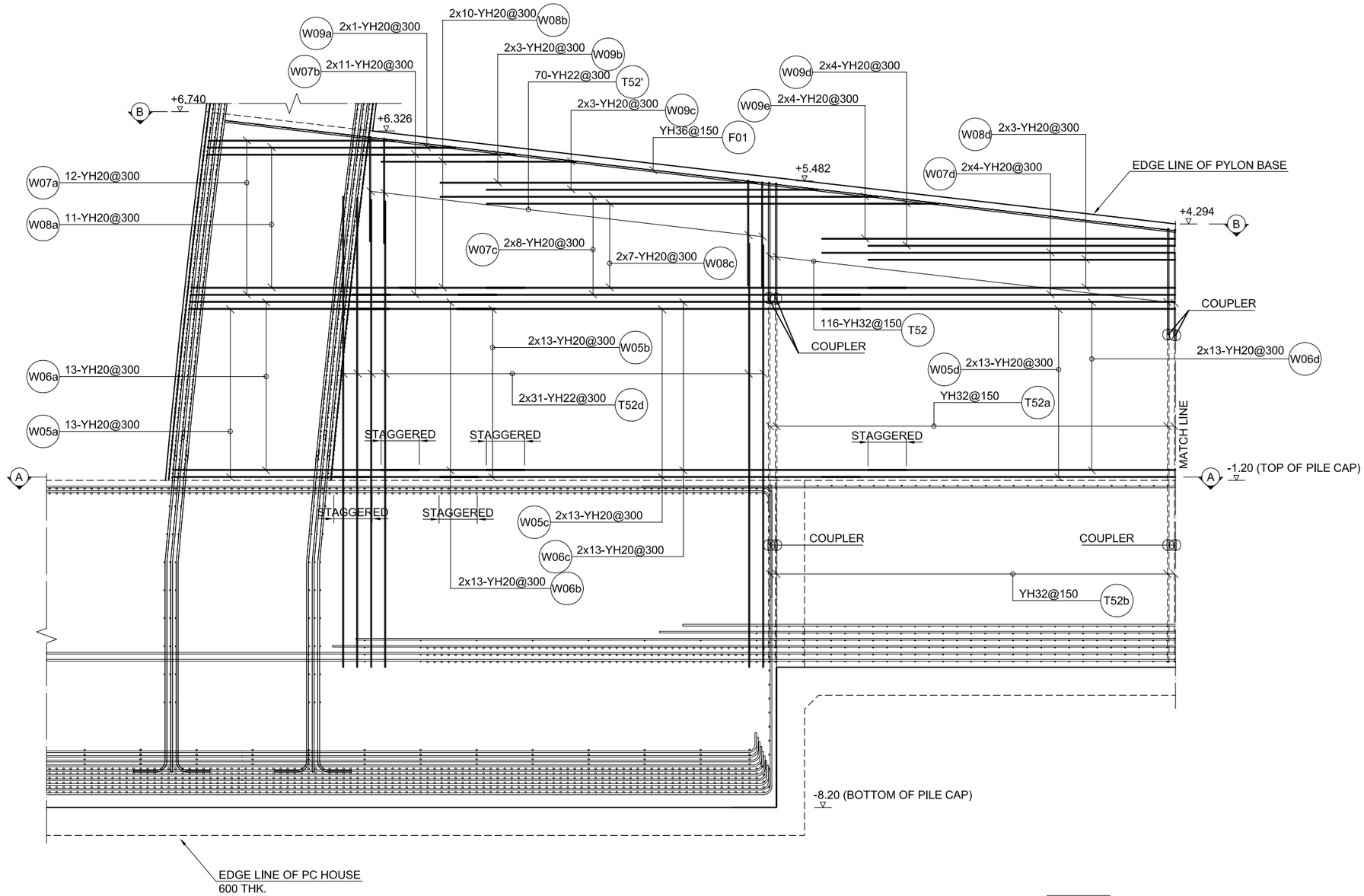
HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

DESIGNER

SYSTRA

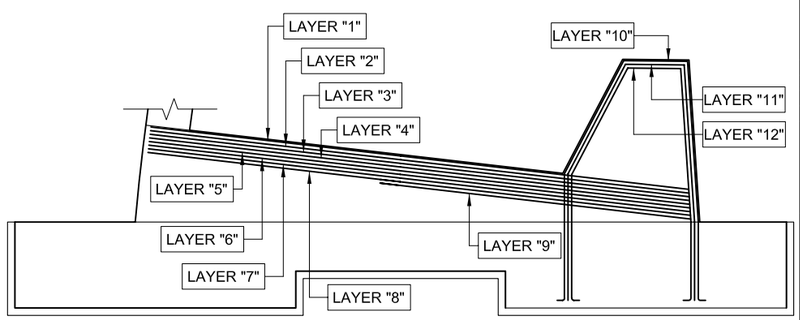
DRAWING NO.	REV.
RA140-22-BRG-CW-BS-32284	B2

A1(594x841mm +2mm)



ELEVATION VIEW OF PYLON BASE 1/2 (P3-M SIDE)

SCALE : 1/50



REINFORCEMENT LAYER

SCALE : NONE

NOTES:

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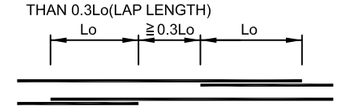
6. FOR SECTION A-A REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32287.
7. FOR SECTION B-B REFER TO DRAWING NO.RA140-22-BRG-CW-DW-32288.
8. THE LONGITUDINAL DISTANCE BETWEEN TWO ADJACENT LAPS SHOULD NOT BE LESS THAN 0.3Lo(LAP LENGTH)



STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

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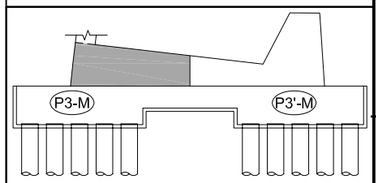

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EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (PYLON BASE)
REINFORCEMENT ARRANGEMENT 1/11

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED				
17/05/15	17/05/15	17/05/15	17/05/15	17/05/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

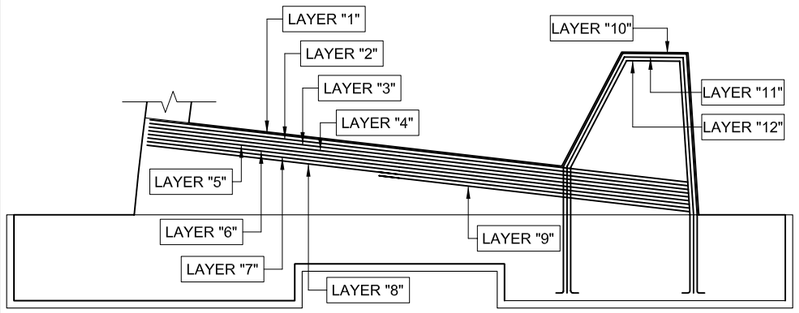
DESIGNER

SYSTRA

DRAWING NO. RA140-22-BRG-CW-DW-32285

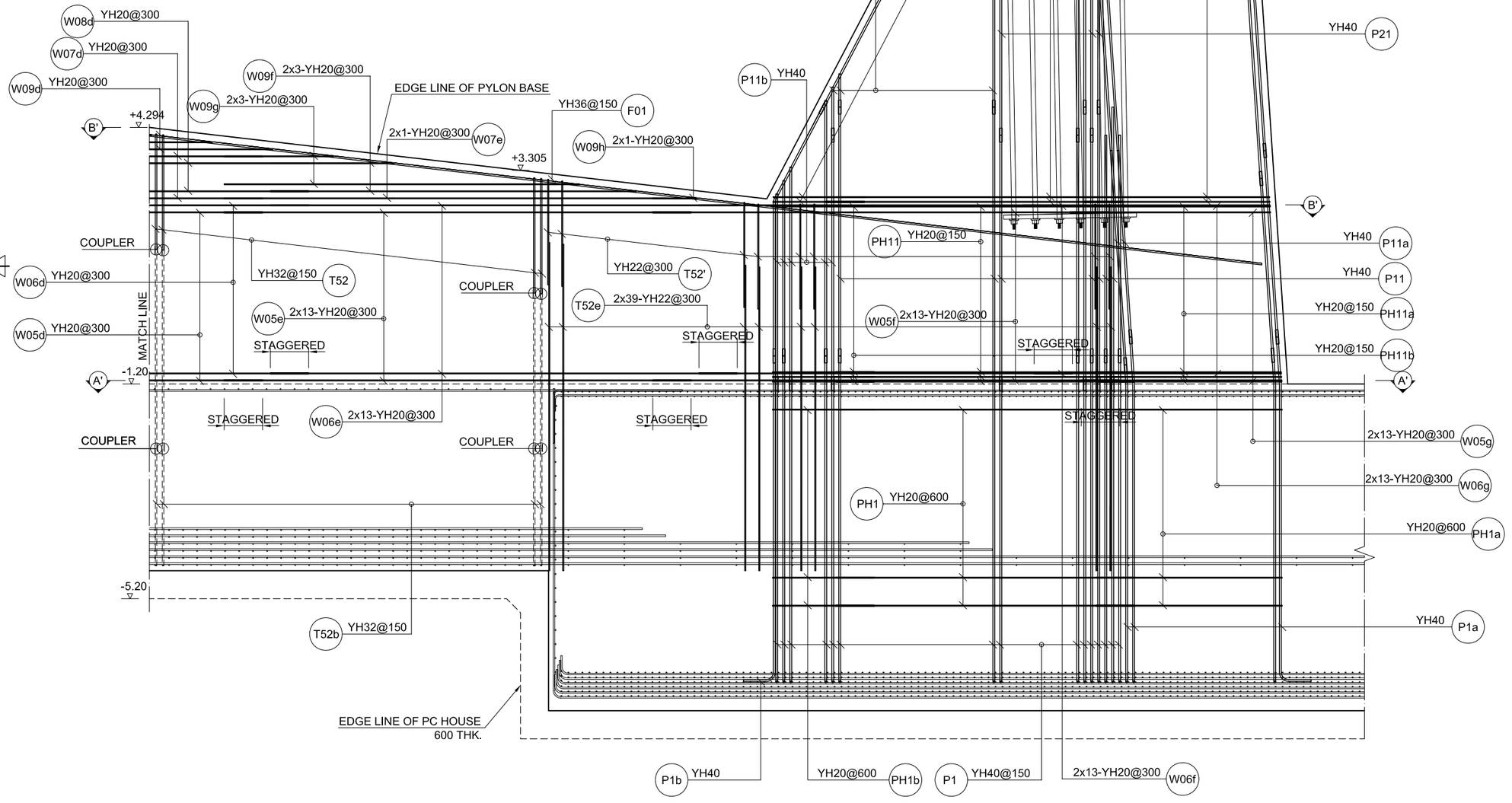
REV. B2

A1(594x841mm +2mm)



REINFORCEMENT LAYER

SCALE : NONE

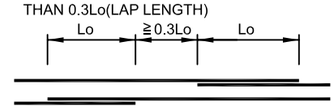


ELEVATION VIEW OF PYLON BASE 2/2 (P3'-M SIDE)

SCALE : 1/50

NOTES:

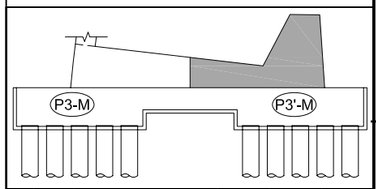
1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
   -PYLON PILE CAP : 40MPa
   -PYLON BASE : 50MPa
3. REINFORCEMENT REBARS SHALL CONFORM TO ASTM A706 GRADE 80(550 MPa) FOR CARBON REBARS(YH).
4. THE STAINLESS STEEL REINFORCEMENT IS RIBBED BARS.
5. MINIMUM CONRETE COVER TO REINFORCEMENT SHALL BE 100mm.
6. FOR SECTION A'-A' REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32287.
7. FOR SECTION B'-B', REFER TO DRAWING NO.RA140-22-BRG-CW-DW-32288.
8. THE LONGITUDINAL DISTANCE BETWEEN TWO ADJACENT LAPS SHOULD NOT BE LESS THAN 0.3Lo(LAP LENGTH)



STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).



REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B2	10/09/15	Updated As Shown In Clouds	SWK	HSH	DKK
B1	12/08/15	Updated As Shown In Clouds	SWK	HSH	DKK
A4	20/07/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	17/05/15	First Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (PYLON BASE)
REINFORCEMENT ARRANGEMENT 2/11

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED				
17/05/15	17/05/15	17/05/15	17/05/15	17/05/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

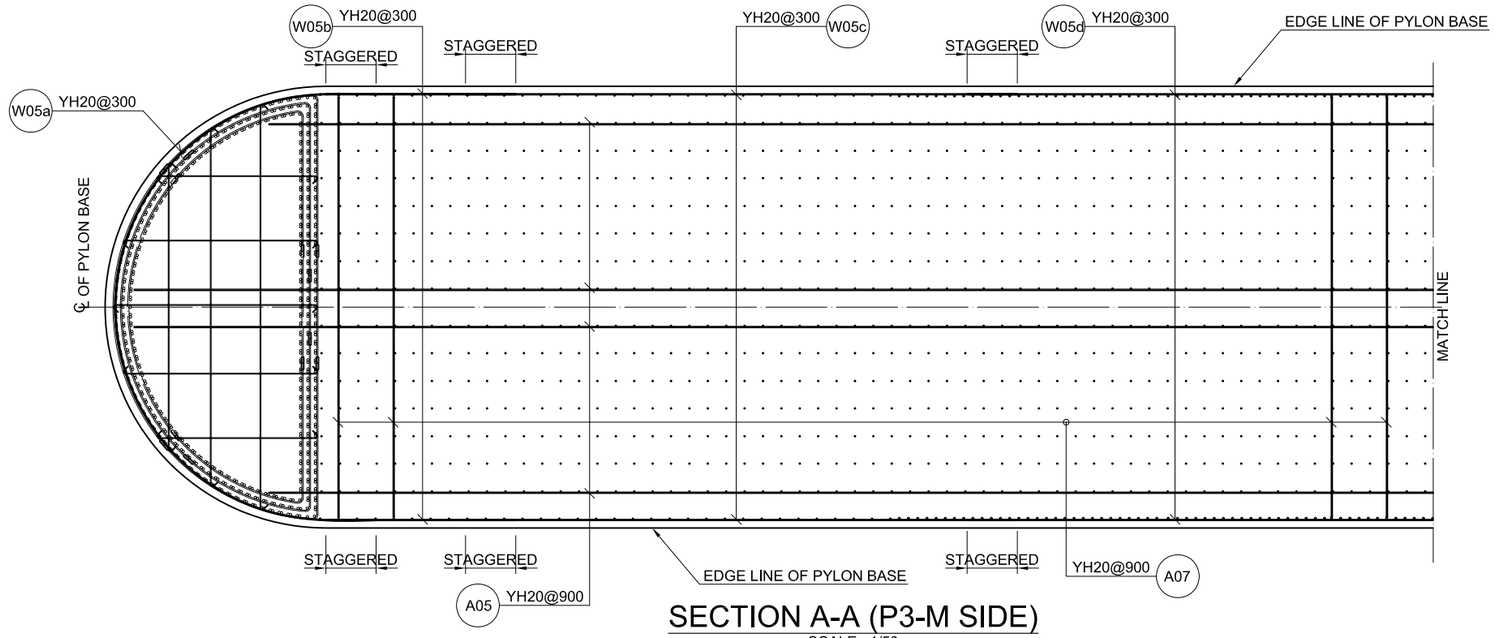
DESIGNER

SYSTRA

DRAWING NO. RA140-22-BRG-CW-DW-32286

REV. B2

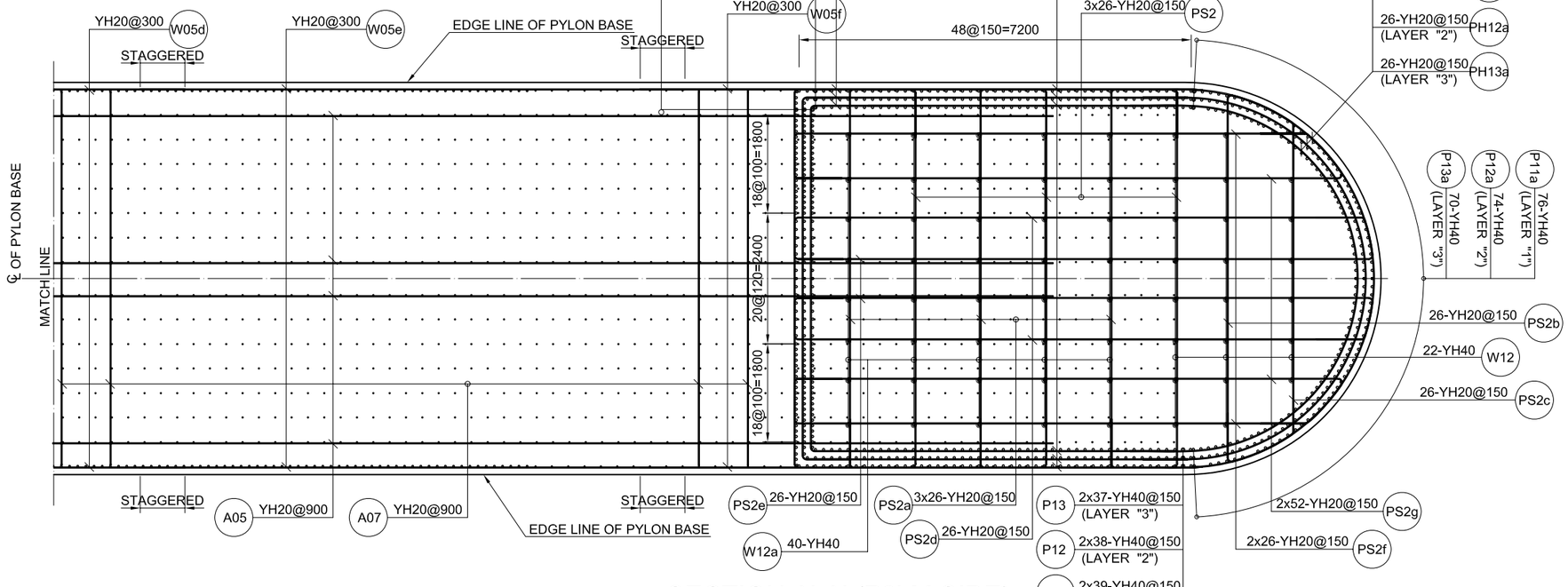
A1(594x841mm +2mm)



SECTION A-A (P3-M SIDE)

SCALE : 1/50

P11c 62-YH40 (LAYER "3")
P12c 58-YH40 (LAYER "2")
P13c 56-YH40 (LAYER "1")
P11b 18-YH40@150 (LAYER "1")
P12b 16-YH40@150 (LAYER "2")
P13b 14-YH40@150 (LAYER "3")
26-YH20@150 (LAYER "1") PH1b
26-YH20@150 (LAYER "2") PH2b
26-YH20@150 (LAYER "3") PH3b
2x26-YH20@150 (LAYER "1") PH11
2x26-YH20@150 (LAYER "2") PH12
2x26-YH20@150 (LAYER "3") PH13

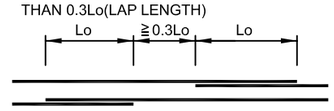


SECTION A'-A' (P3'-M SIDE)

SCALE : 1/50

NOTES:

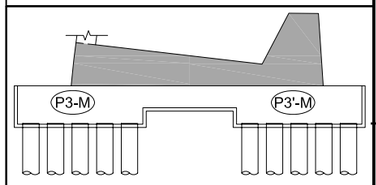
1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
   -PYLON PILE CAP : 40MPa
   -PYLON BASE : 50MPa
3. REINFORCEMENT REBARS SHALL CONFORM TO ASTM A706 GRADE 80(550 MPa) FOR CARBON REBARS(YH).
4. THE STAINLESS STEEL REINFORCEMENT IS RIBBED BARS.
5. MINIMUM CONRETE COVER TO REINFORCEMENT SHALL BE 100mm.
6. FOR SECTION A-A REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32285.
7. FOR SECTION A'-A' REFER TO DRAWING NO.RA140-22-BRG-CW-DW-32286.
8. THE LONGITUDINAL DISTANCE BETWEEN TWO ADJACENT LAPS SHOULD NOT BE LESS THAN 0.3Lo(LAP LENGTH)



STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).



REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B1	12/08/15	Updated As Shown In Clouds	SWK	HSH	DKK
A4	20/07/15	Updated As Shown In Clouds	SWK	HSH	DKK
A3	17/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	17/05/15	First Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (PYLON BASE)
REINFORCEMENT ARRANGEMENT 3/11

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED				
17/05/15	17/05/15	17/05/15	17/05/15	17/05/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

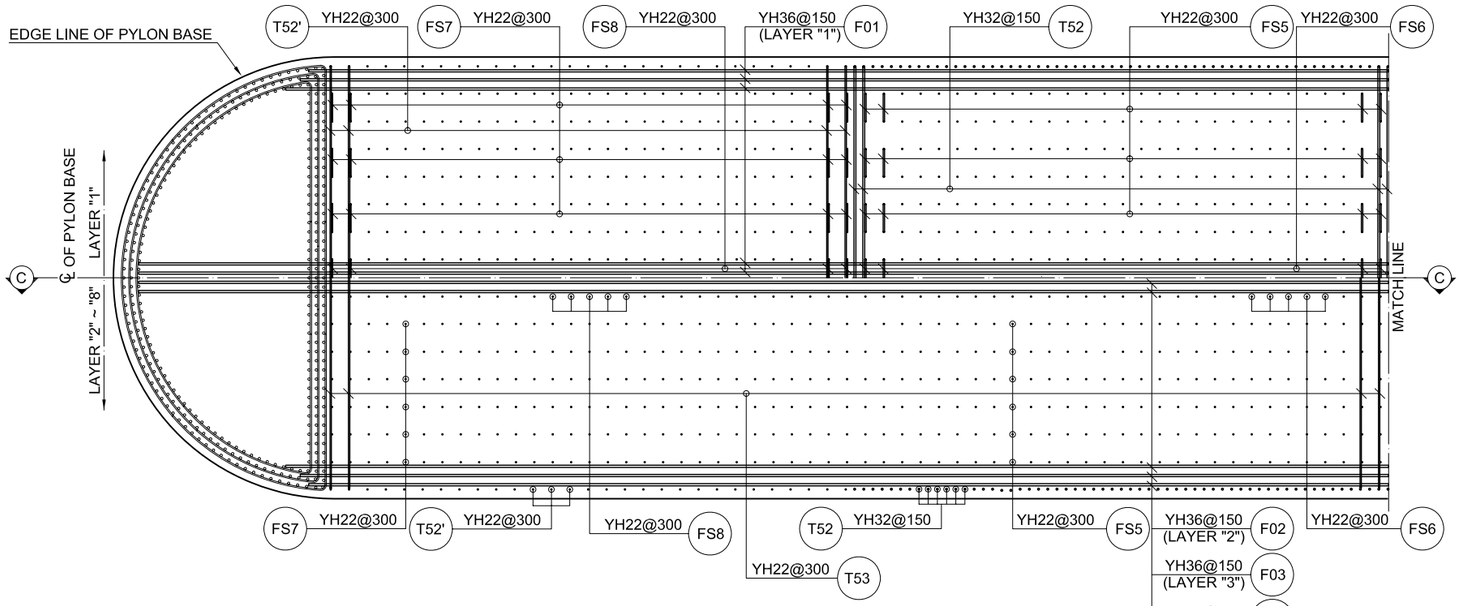
DESIGNER

SYSTRA

DRAWING NO. RA140-22-BRG-CW-DW-32287

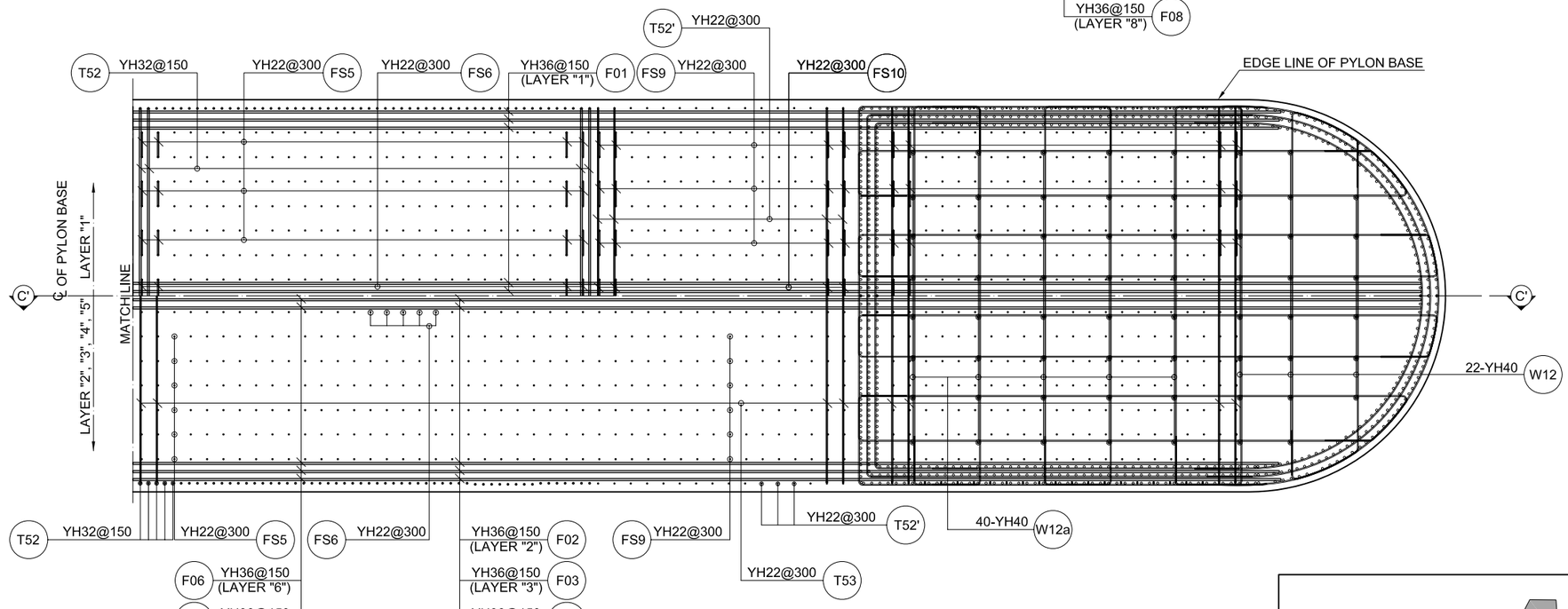
REV. B1

A1(594x841mm +2mm)



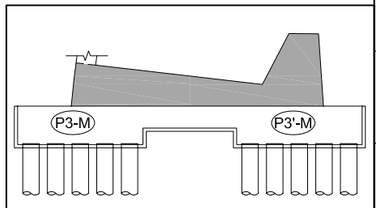
SECTION B-B (LAYER "1" ~ "8" - P3-M SIDE)

SCALE : 1/50



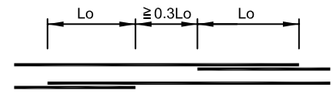
SECTION B'-B' (LAYER "1" ~ "8" - P3'-M SIDE)

SCALE : 1/50



NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
   -PYLON PILE CAP : 40MPa
   -PYLON BASE : 50MPa
3. REINFORCEMENT REBARS SHALL CONFORM TO ASTM A706 GRADE 80(550 MPa) FOR CARBON REBARS(YH).
4. THE STAINLESS STEEL REINFORCEMENT IS RIBBED BARS.
5. MINIMUM CONRETE COVER TO REINFORCEMENT SHALL BE 100mm.
7. FOR SECTION B-B REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32285.
8. FOR SECTION B'-B' REFER TO DRAWING NO.RA140-22-BRG-CW-DW-32286.
9. FOR SECTION C-C REFER TO DRAWING NO.RA140-22-BRG-CW-DW-32290.
10. FOR SECTION C'-C' REFER TO DRAWING NO.RA140-22-BRG-CW-DW-32291.
11. THE LONGITUDINAL DISTANCE BETWEEN TWO ADJACENT LAPS SHOULD NOT BE LESS THAN 0.3Lo(LAP LENGTH)



STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).

REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B1	12/08/15	Updated As Shown In Clouds	SWK	HSH	DKK
A4	20/07/15	Updated As Shown In Clouds	SWK	HSH	DKK
A3	17/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	17/05/15	First Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (PYLON BASE)
REINFORCEMENT ARRANGEMENT 4/11

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED	17/05/15	17/05/15	17/05/15	17/05/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

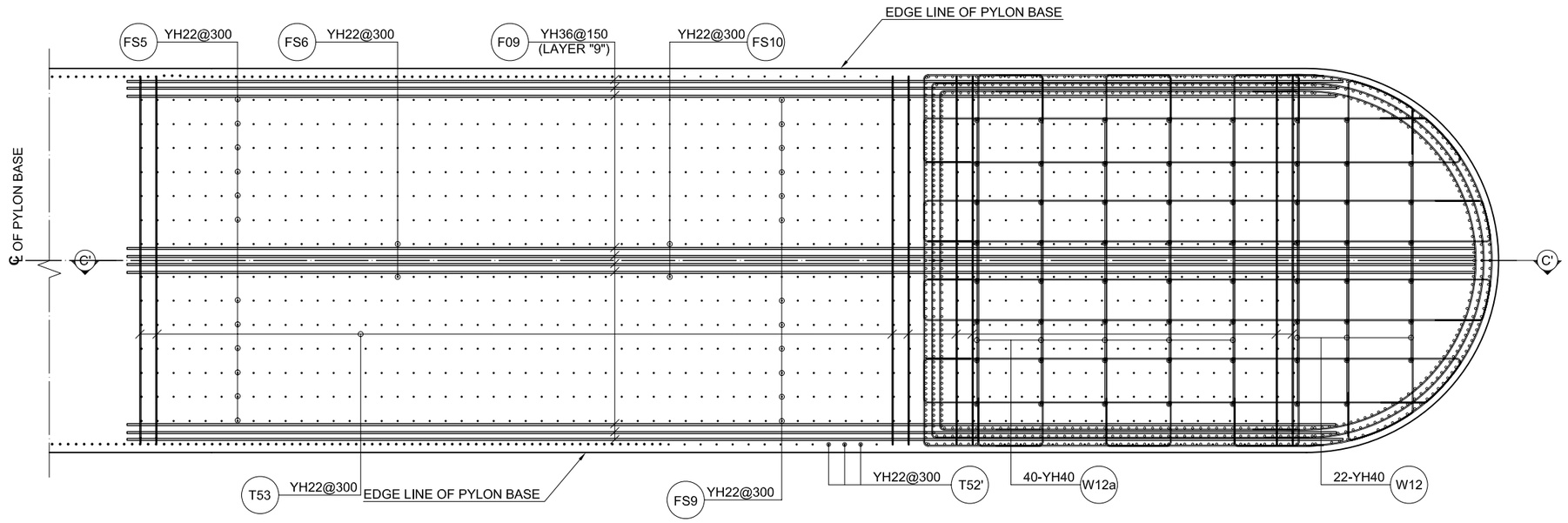
DESIGNER

SYSTRA

DRAWING NO. RA140-22-BRG-CW-DW-32288

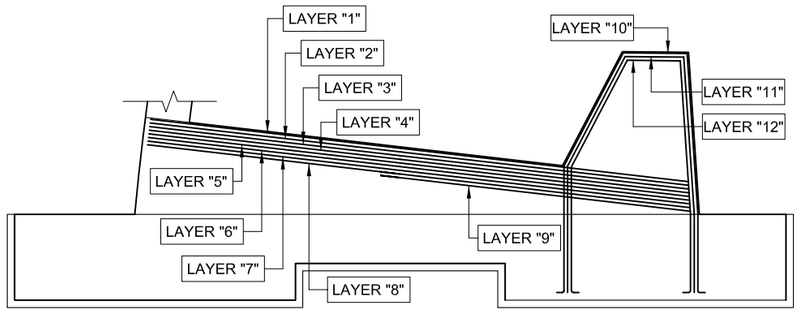
REV. B1

A1(594x841mm +2mm)



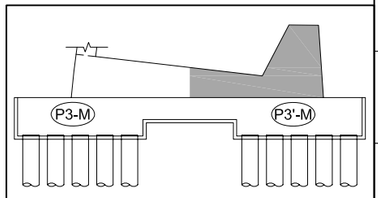
SECTION B'-B' (LAYER "9" - P3'-M SIDE)

SCALE : 1/50



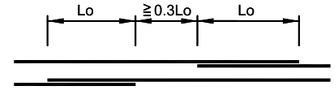
REINFORCEMENT LAYER

SCALE : NONE



NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
   -PYLON PILE CAP : 40MPa
   -PYLON BASE : 50MPa
3. REINFORCEMENT REBARS SHALL CONFORM TO ASTM A706 GRADE 80(550 MPa) FOR CARBON REBARS(YH).
4. THE STAINLESS STEEL REINFORCEMENT IS RIBBED BARS.
5. MINIMUM CONRETE COVER TO REINFORCEMENT SHALL BE 100mm.
7. FOR SECTION B-B REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32285.
8. FOR SECTION B'-B' REFER TO DRAWING NO.RA140-22-BRG-CW-DW-32286.
9. THE LONGITUDINAL DISTANCE BETWEEN TWO ADJACENT LAPS SHOULD NOT BE LESS THAN 0.3Lo(LAP LENGTH)



STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).

REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B1	12/08/15	Updated As Shown In Clouds	SWK	HSH	DKK
A4	20/07/15	Updated As Shown In Clouds	SWK	HSH	DKK
A3	17/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	17/05/15	FIrst Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (PYLON BASE)
REINFORCEMENT ARRANGEMENT 5/11

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED				
17/05/15	17/05/15	17/05/15	17/05/15	17/05/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

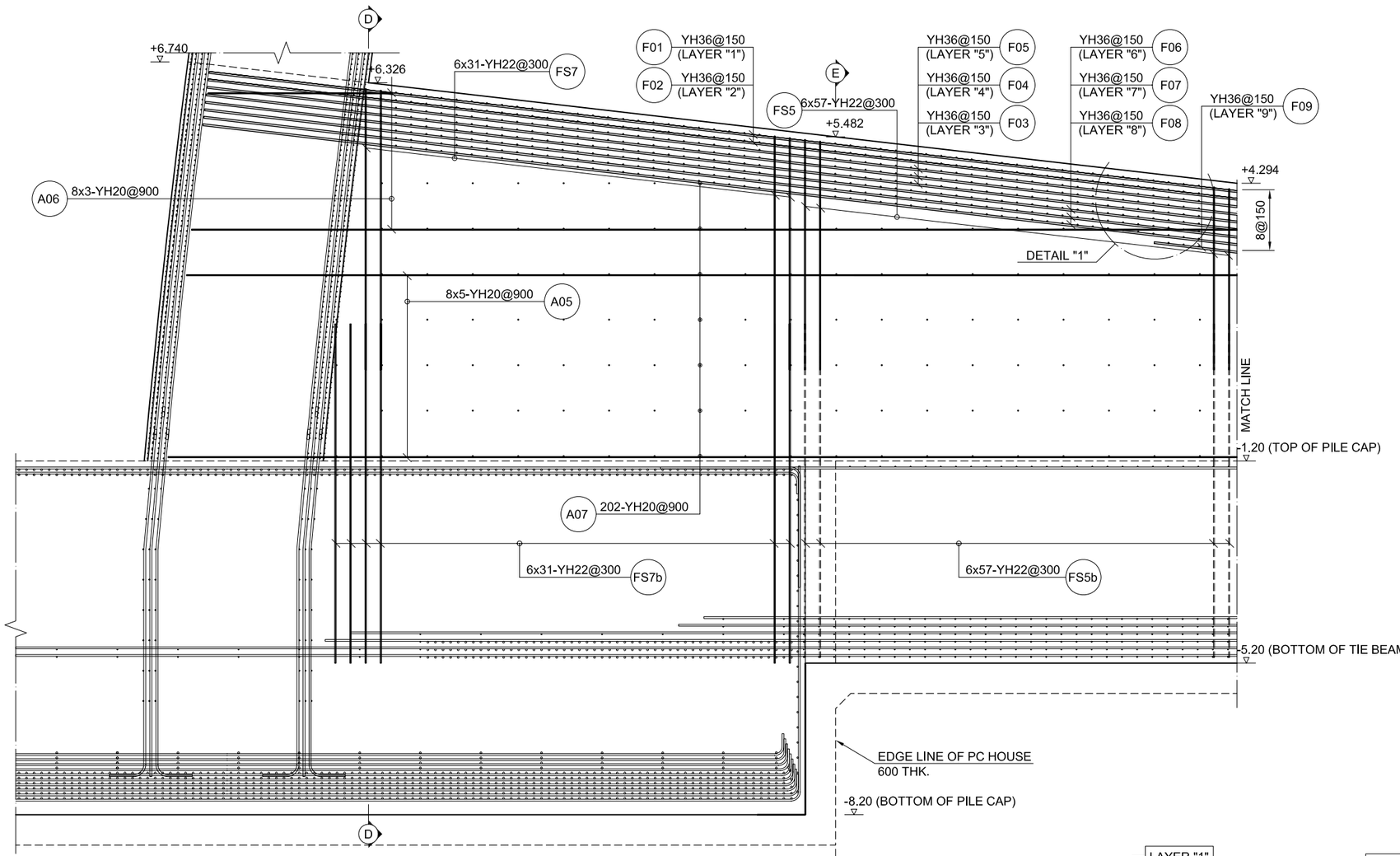
DESIGNER

SYSTRA

DRAWING NO. RA140-22-BRG-CW-DW-32289

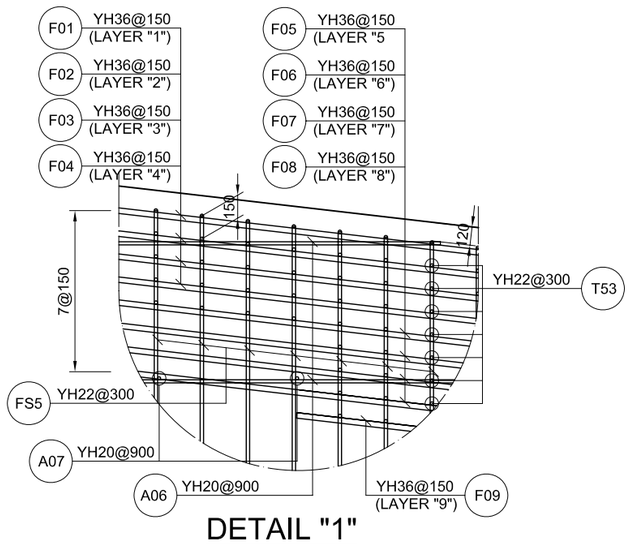
REV. B1

A1(594x841mm +2mm)



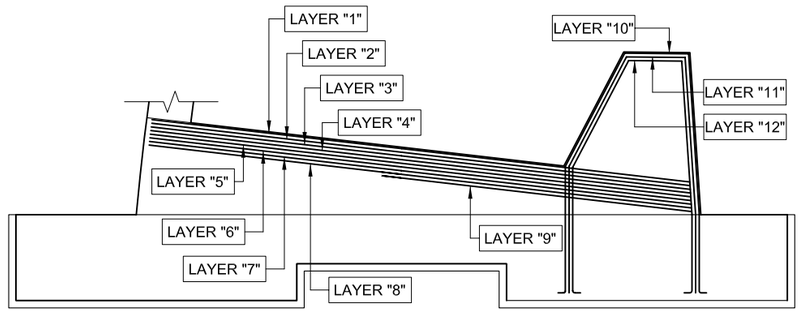
SECTION C-C (P3-M SIDE)

SCALE : 1/50



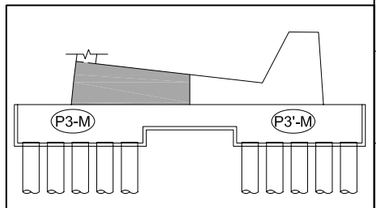
DETAIL "1"

SCALE : 1/20



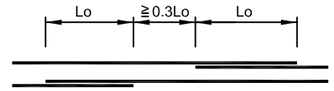
REINFORCEMENT LAYER

SCALE : NONE



NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
   -PYLON PILE CAP : 40MPa
   -PYLON BASE : 50MPa
3. REINFORCEMENT REBARS SHALL CONFORM TO ASTM A706 GRADE 80(550 MPa) FOR CARBON REBARS(YH).
4. THE STAINLESS STEEL REINFORCEMENT IS RIBBED BARS.
5. MINIMUM CONRETE COVER TO REINFORCEMENT SHALL BE 100mm.
6. FOR SECTION C-C REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32288.
7. FOR SECTION D-D,E-E REFER TO DRAWING NO.RA140-22-BRG-CW-DW-32292.
8. THE LONGITUDINAL DISTANCE BETWEEN TWO ADJACENT LAPS SHOULD NOT BE LESS THAN 0.3Lo(LAP LENGTH)



STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).

REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B2	10/09/15	Updated As Shown In Clouds	SWK	HSH	DKK
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A4	20/07/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	17/05/15	First Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (PYLON BASE)
REINFORCEMENT ARRANGEMENT 6/11

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED				
17/05/15	17/05/15	17/05/15	17/05/15	17/05/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

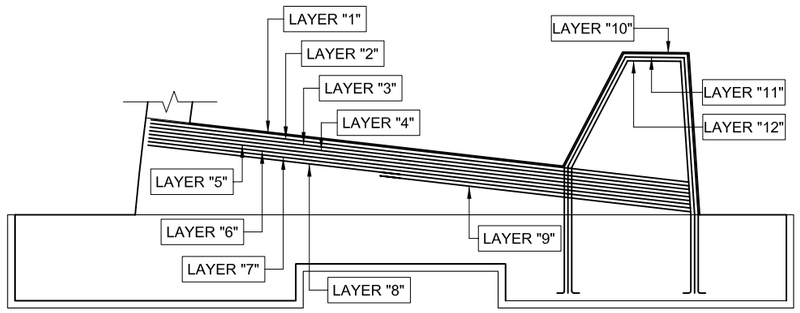
DESIGNER

SYSTRA

DRAWING NO. RA140-22-BRG-CW-DW-32290

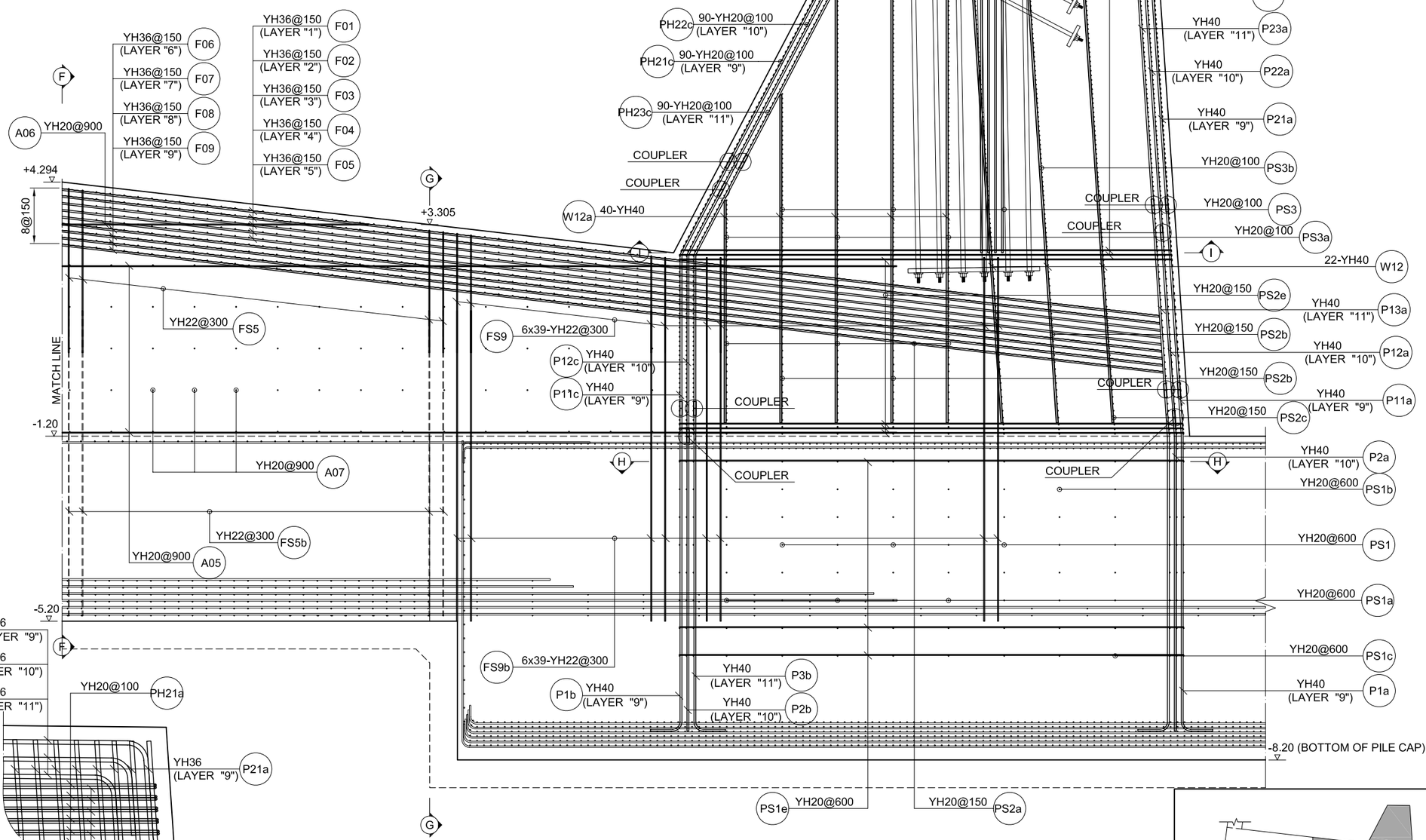
REV. B2

A1(594x841mm +2mm)



REINFORCEMENT LAYER

SCALE : NONE

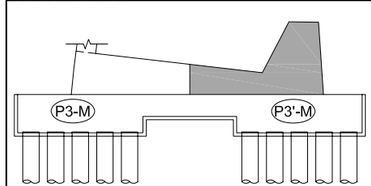


SECTION C'-C' (P3"-M SIDE)

SCALE : 1/50

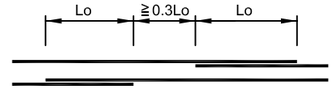
DETAIL "2"

SCALE : 1/20



NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
   -PYLON PILE CAP : 40MPa
   -PYLON BASE : 50MPa
3. REINFORCEMENT REBARS SHALL CONFORM TO ASTM A706 GRADE 80(550 MPa) FOR CARBON REBARS(YH).
4. THE STAINLESS STEEL REINFORCEMENT IS RIBBED BARS.
5. MINIMUM CONRETE COVER TO REINFORCEMENT SHALL BE 100mm.
6. FOR SECTION C'-C' REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32288 TO 32289
7. FOR SECTION F-F, G-G REFER TO DRAWING NO.RA140-22-BRG-CW-DW-32293.
8. FOR SECTION H-H,I-I REFER TO DRAWING NO.RA140-22-BRG-CW-DW-32294.
9. FOR SECTION J-J,K-K REFER TO DRAWING NO.RA140-22-BRG-CW-DW-32295
10. THE LONGITUDINAL DISTANCE BETWEEN TWO ADJACENT LAPS SHOULD NOT BE LESS THAN 0.3Lo(LAP LENGTH)



STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).

REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B2	10/09/15	Updated As Shown In Clouds	SWK	HSH	DKK
B1	12/08/15	Updated As Shown In Clouds	SWK	HSH	DKK
A4	20/07/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	17/05/15	First Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (PYLON BASE)
REINFORCEMENT ARRANGEMENT 7/11

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED	17/05/15	17/05/15	17/05/15	17/05/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

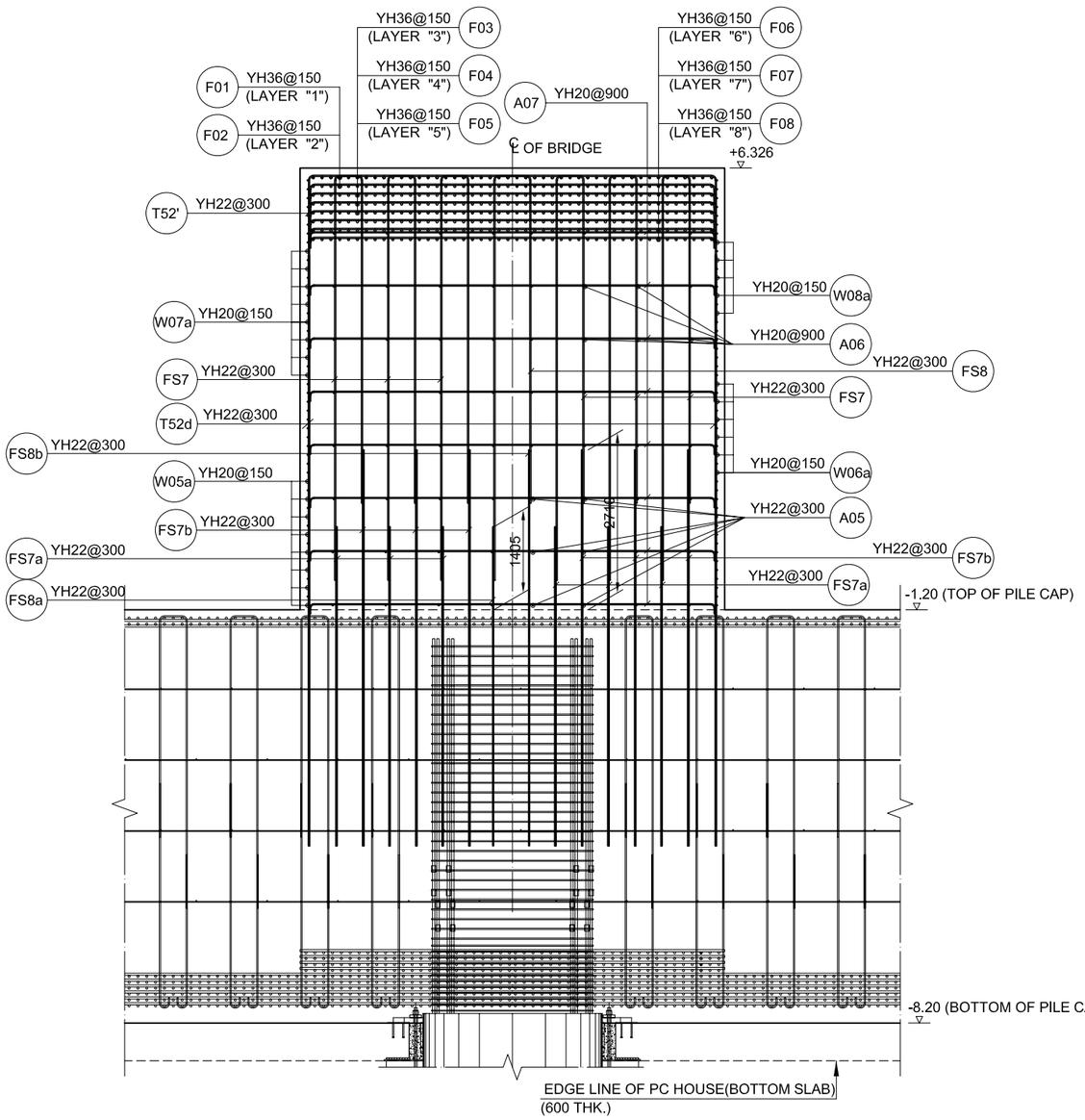
DESIGNER

SYSTRA

DRAWING NO. RA140-22-BRG-CW-DW-32291

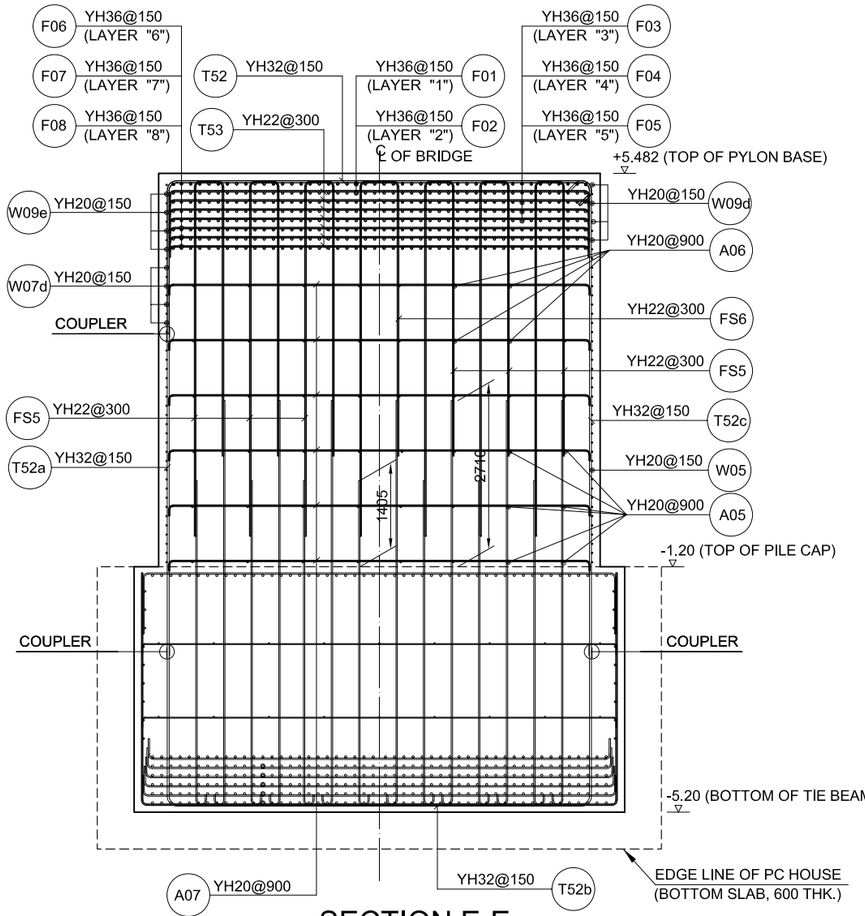
REV. B2

A1(594x841mm +2mm)



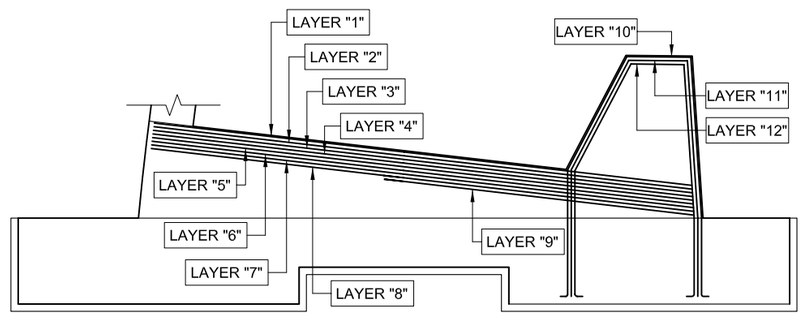
SECTION D-D

SCALE : 1/50



SECTION E-E

SCALE : 1/50

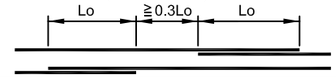


REINFORCEMENT LAYER

SCALE : NONE

NOTES:

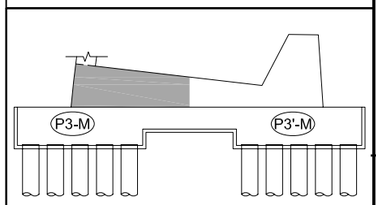
1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
   -PYLON PILE CAP : 40MPa
   -PYLON BASE : 50MPa
3. REINFORCEMENT REBARS SHALL CONFORM TO ASTM A706 GRADE 80(550 MPa) FOR CARBON REBARS(YH).
4. THE STAINLESS STEEL REINFORCEMENT IS RIBBED BARS.
5. MINIMUM CONRETE COVER TO REINFORCEMENT SHALL BE 100mm.
6. FOR SECTION D-D, E-E REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32290.
7. THE LONGITUDINAL DISTANCE BETWEEN TWO ADJACENT LAPS SHOULD NOT BE LESS THAN 0.3Lo(LAP LENGTH)



STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).



REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B2	10/09/15	Updated As Shown In Clouds	SWK	HSH	DKK
B1	12/08/15	Updated As Shown In Clouds	SWK	HSH	DKK
A4	20/07/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	17/05/15	First Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (PYLON BASE)
REINFORCEMENT ARRANGEMENT 8/11

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED	17/05/15	17/05/15	17/05/15	17/05/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

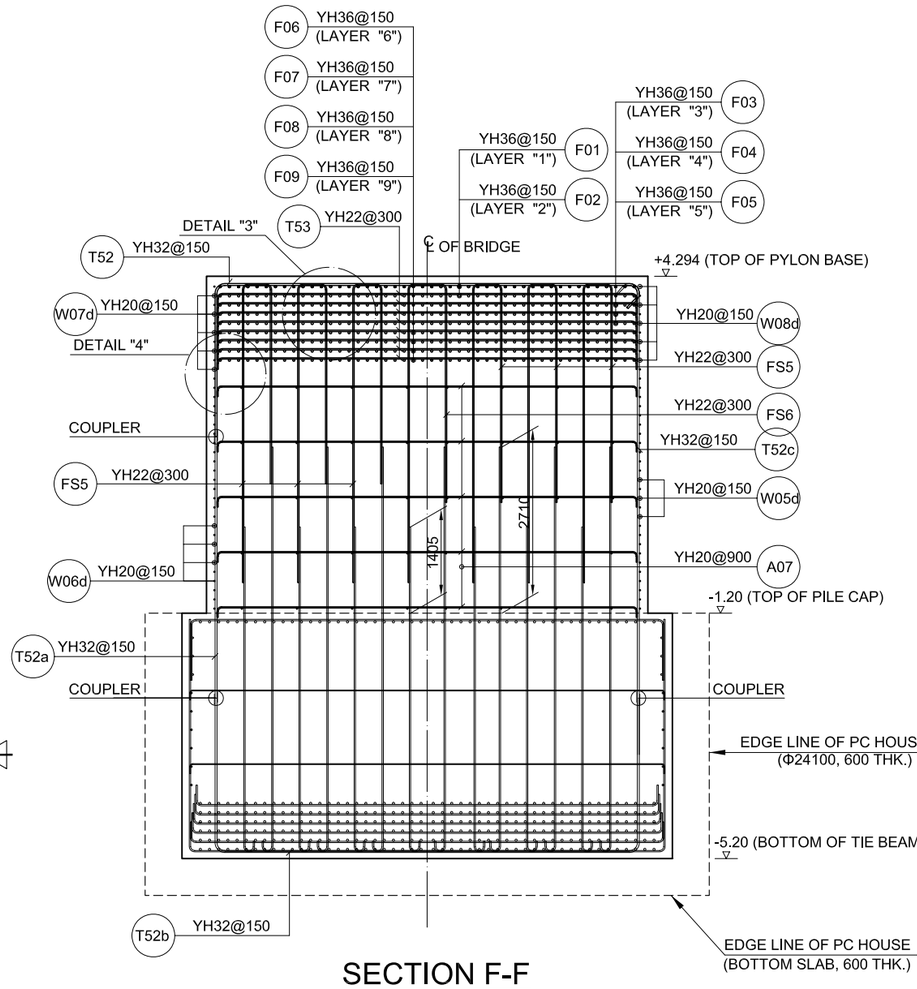
DESIGNER

SYSTRA

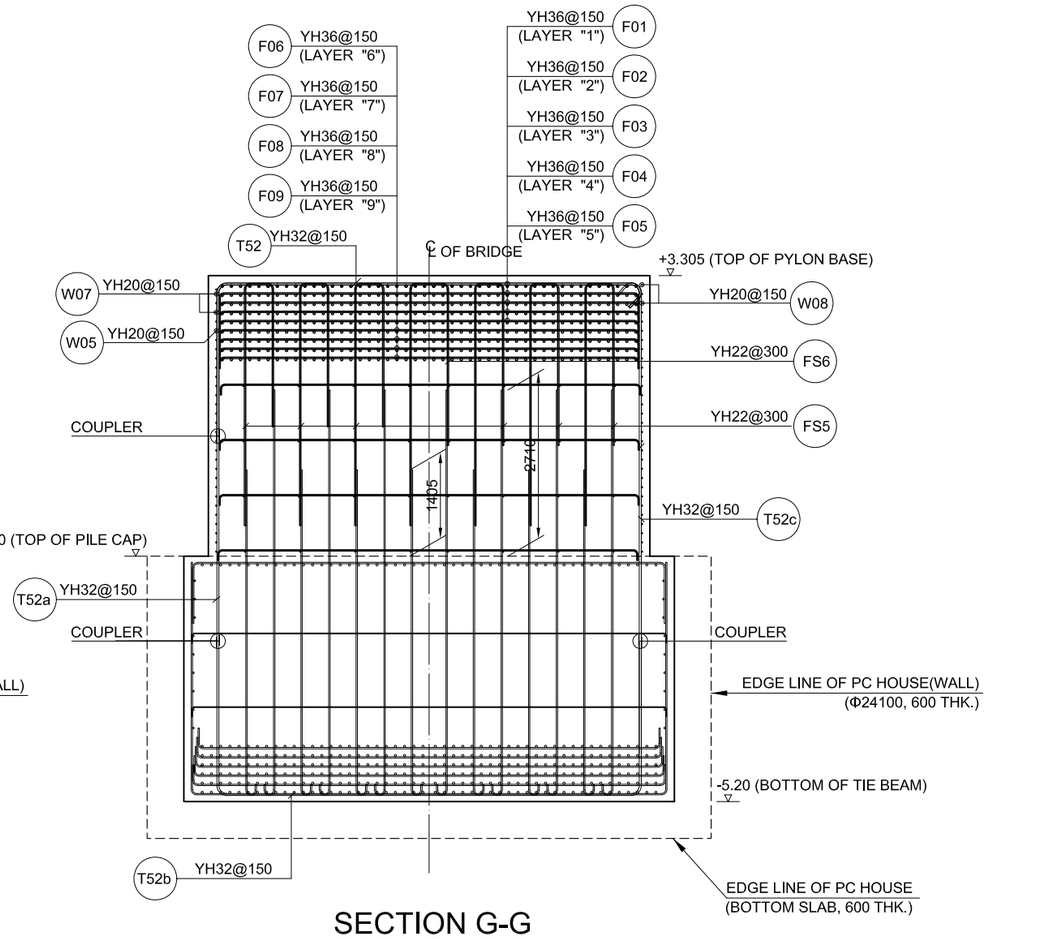
DRAWING NO. RA140-22-BRG-CW-DW-32292

REV. B2

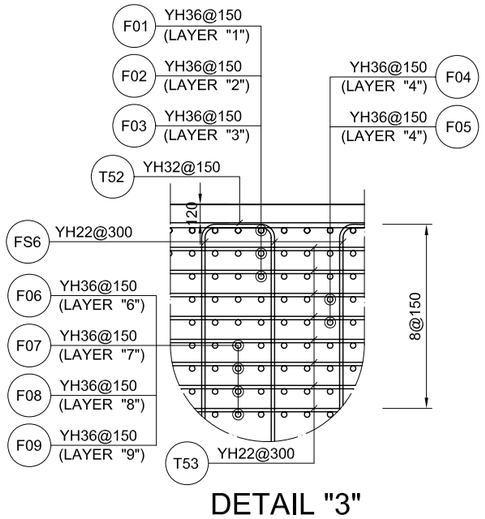
A1(594x841mm +2mm)



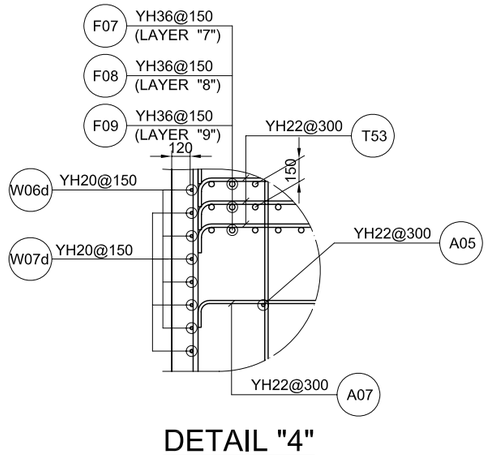
SECTION F-F
SCALE : 1/50



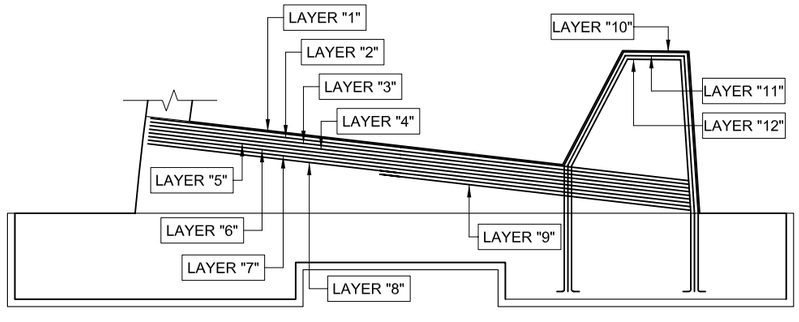
SECTION G-G
SCALE : 1/50



DETAIL "3"
SCALE : 1/20



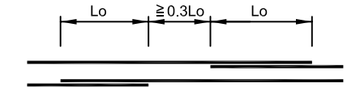
DETAIL "4"
SCALE : 1/20



REINFORCEMENT LAYER
SCALE : NONE

NOTES:

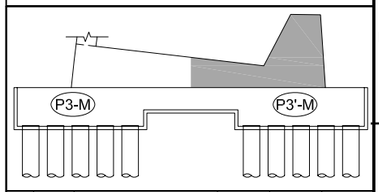
1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
   -PYLON PILE CAP : 40MPa
   -PYLON BASE : 50MPa
3. REINFORCEMENT REBARS SHALL CONFORM TO ASTM A706 GRADE 80(550 MPa) FOR CARBON REBARS(YH).
4. THE STAINLESS STEEL REINFORCEMENT IS RIBBED BARS.
5. MINIMUM CONRETE COVER TO REINFORCEMENT SHALL BE 100mm.
6. FOR SECTION F-F, G-G REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32291.
7. THE LONGITUDINAL DISTANCE BETWEEN TWO ADJACENT LAPS SHOULD NOT BE LESS THAN 0.3Lo(LAP LENGTH)



STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).



REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B2	10/09/15	Updated As Shown In Clouds	SWK	HSH	DKK
B1	12/08/15	Updated As Shown In Clouds	SWK	HSH	DKK
A4	20/07/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	17/05/15	First Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (PYLON BASE)
REINFORCEMENT ARRANGEMENT 9/11

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED				
17/05/15	17/05/15	17/05/15	17/05/15	17/05/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION — Combined Group Contracting Company

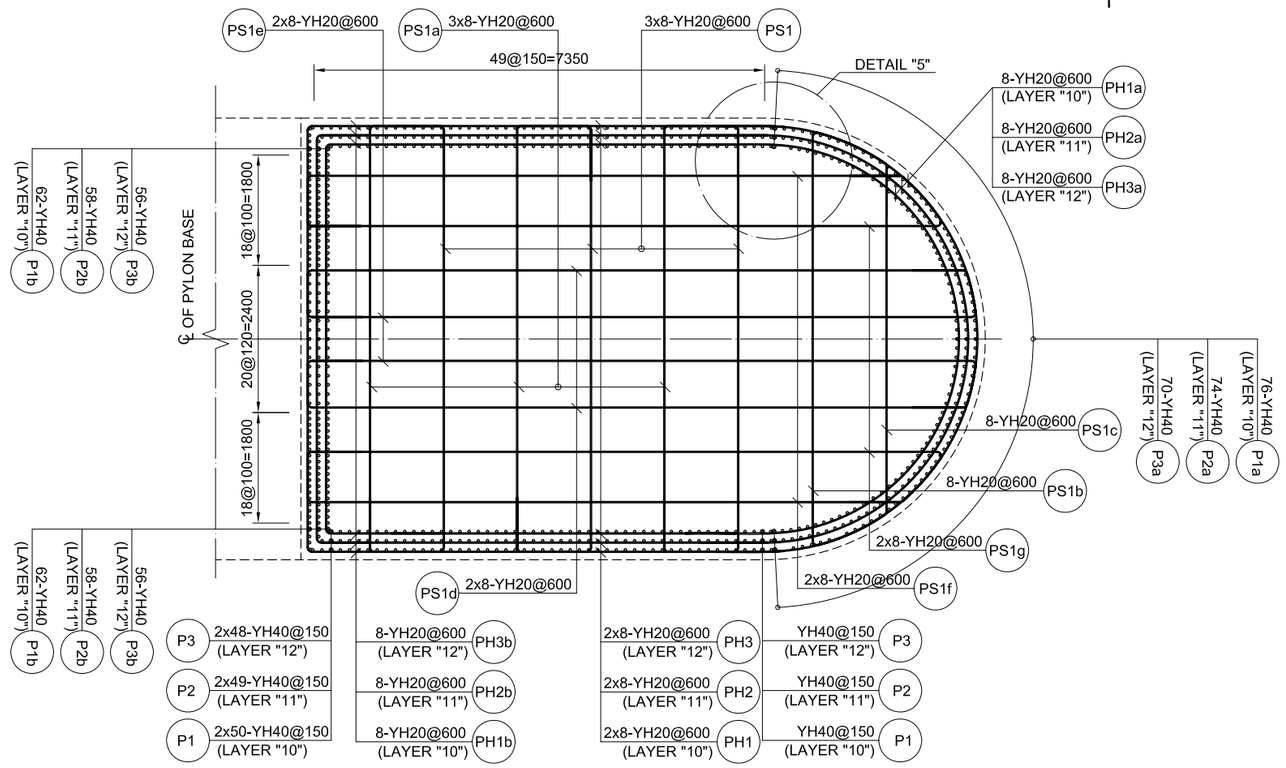
DESIGNER

SYSTRA

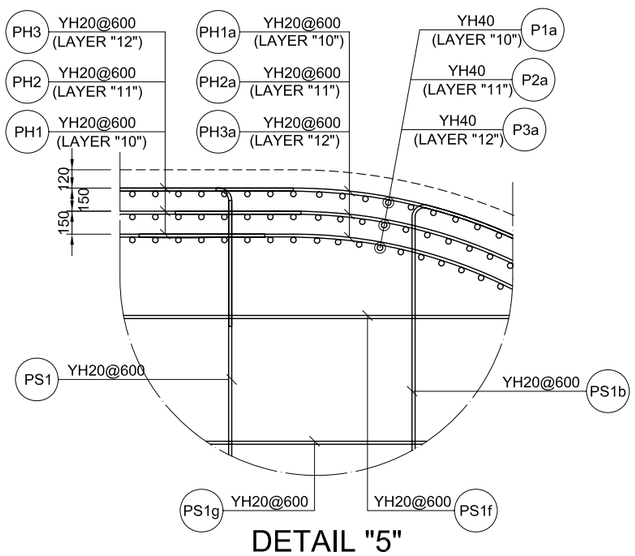
DRAWING NO. RA140-22-BRG-CW-DW-32293

REV. B2

A1(594x841mm +2mm)



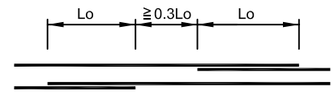
SECTION H-H
SCALE : 1/50



DETAIL "5"
SCALE : 1/20

NOTES:

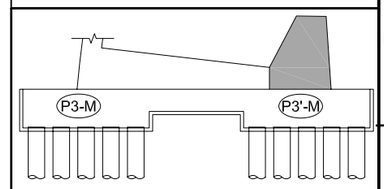
1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
   -PYLON PILE CAP : 40MPa
   -PYLON BASE : 50MPa
3. REINFORCEMENT REBARS SHALL CONFORM TO ASTM A706 GRADE 80(550 MPa) FOR CARBON REBARS(YH).
4. THE STAINLESS STEEL REINFORCEMENT IS RIBBED BARS.
5. MINIMUM CONRETE COVER TO REINFORCEMENT SHALL BE 100mm.
7. FOR SECTION H-H, I-I REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32291.
8. THE LONGITUDINAL DISTANCE BETWEEN TWO ADJACENT LAPS SHOULD NOT BE LESS THAN 0.3Lo(LAP LENGTH)

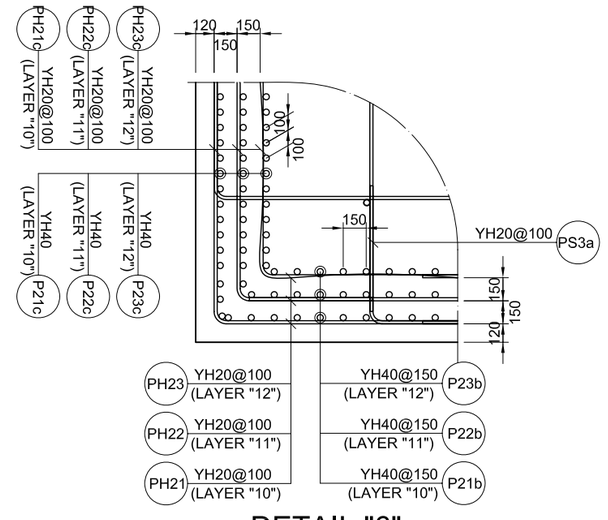


STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).





DETAIL "6"
SCALE : 1/20

REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B1	12/08/15	Updated As Shown In Clouds	SWK	HSH	DKK
A4	20/07/15	Updated As Shown In Clouds	SWK	HSH	DKK
A3	17/06/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	17/05/15	First Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (PYLON BASE)
REINFORCEMENT ARRANGEMENT 10/11

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED	17/05/15	17/05/15	17/05/15	17/05/15

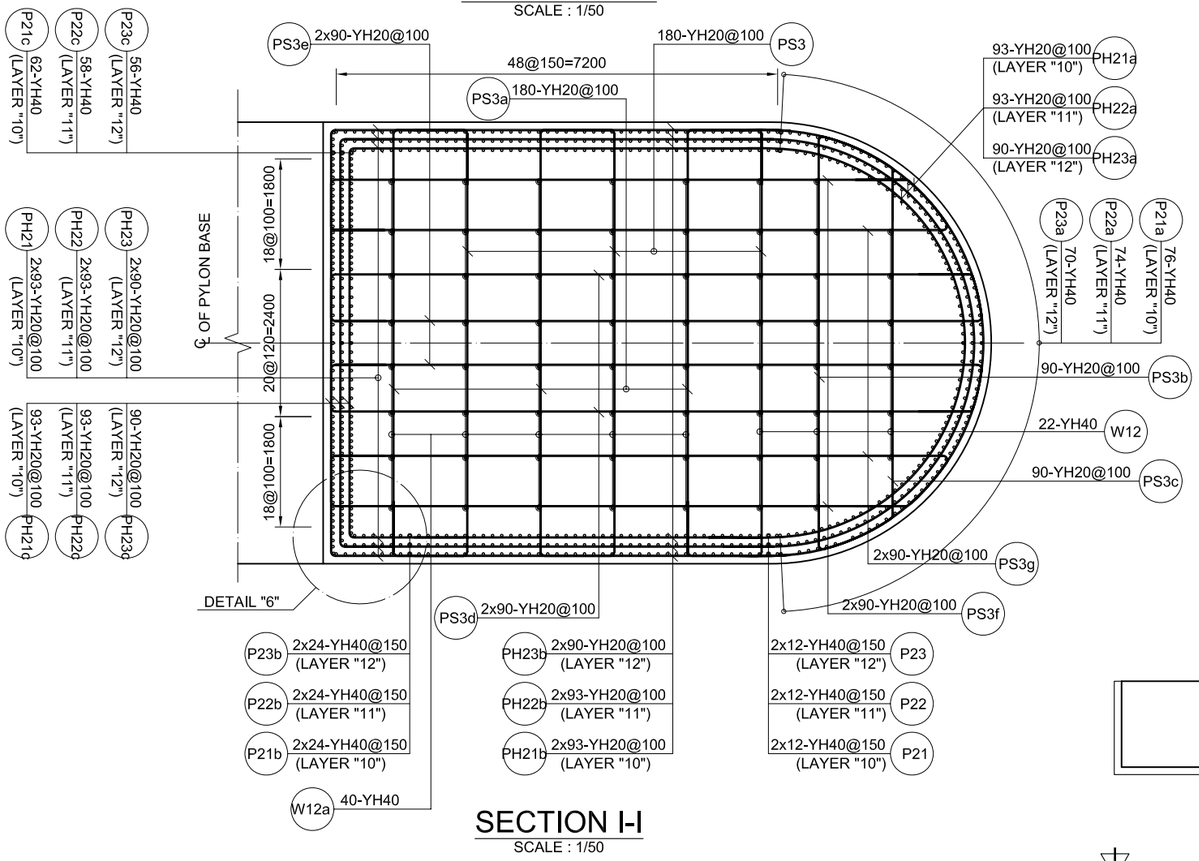
CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

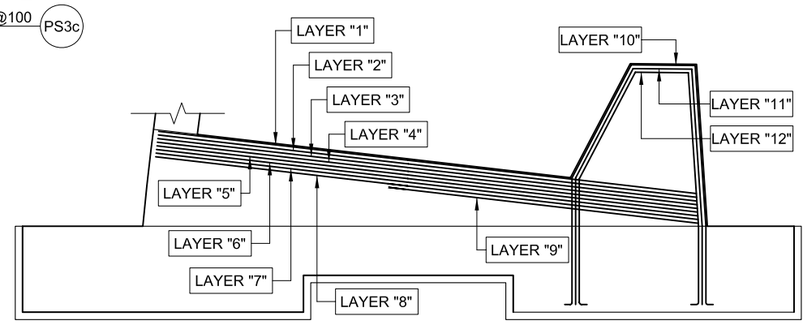
DESIGNER

SYSTRA

DRAWING NO. RA140-22-BRG-CW-DW-32294 REV. B1

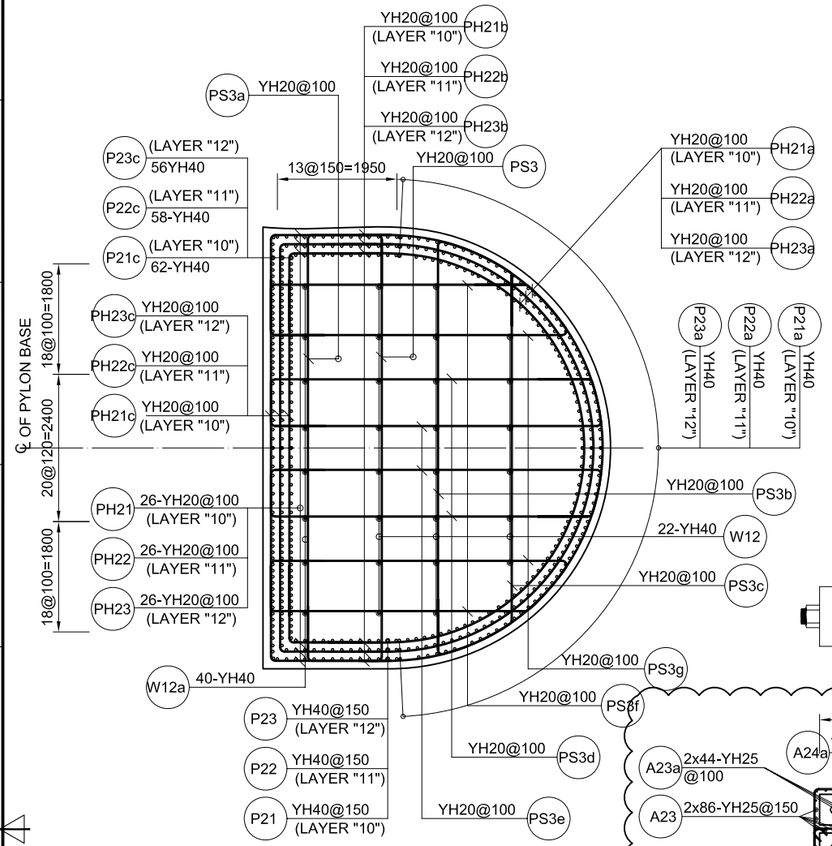


SECTION I-I
SCALE : 1/50

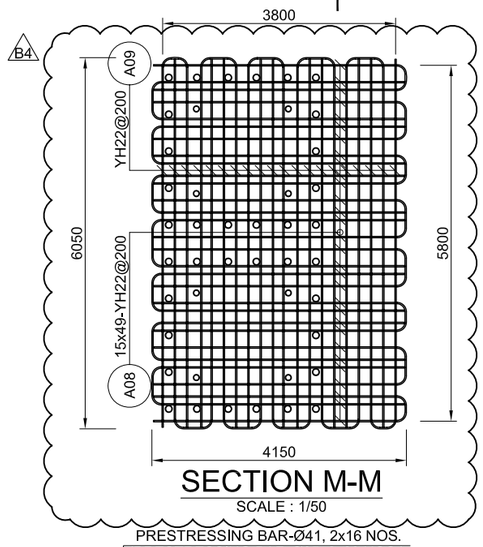


REINFORCEMENT LAYER
SCALE : NONE

A1(594x841mm +-2mm)

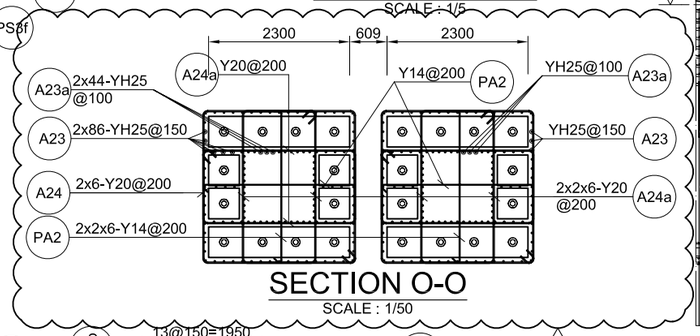


SECTION J-J
SCALE : 1/50

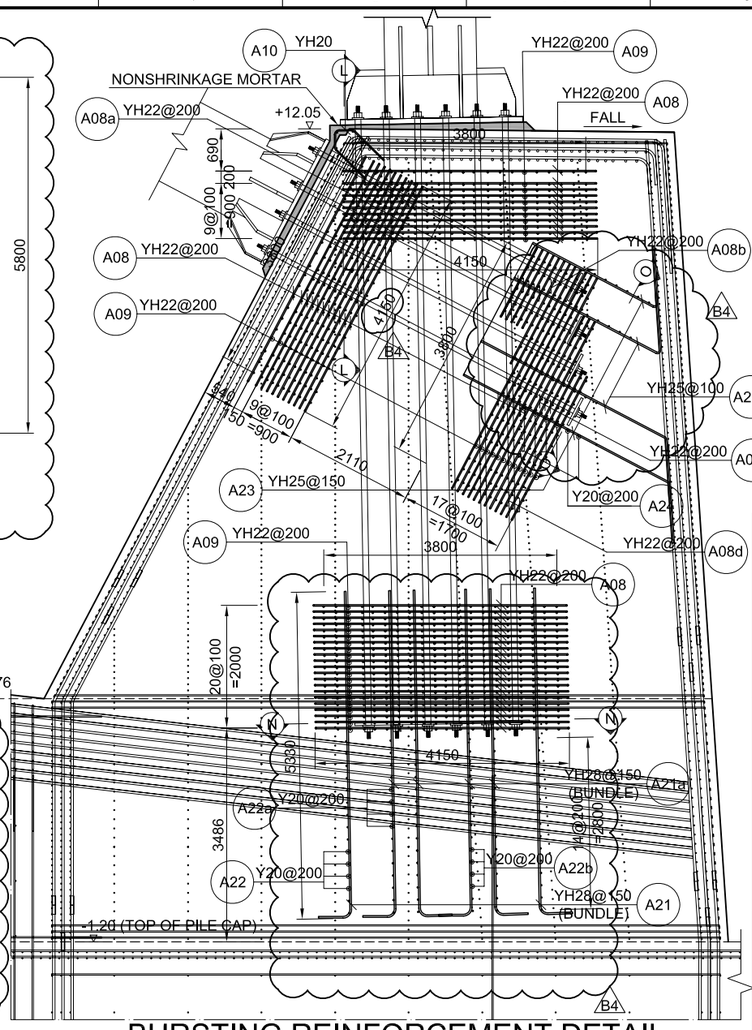


SECTION M-M
SCALE : 1/50

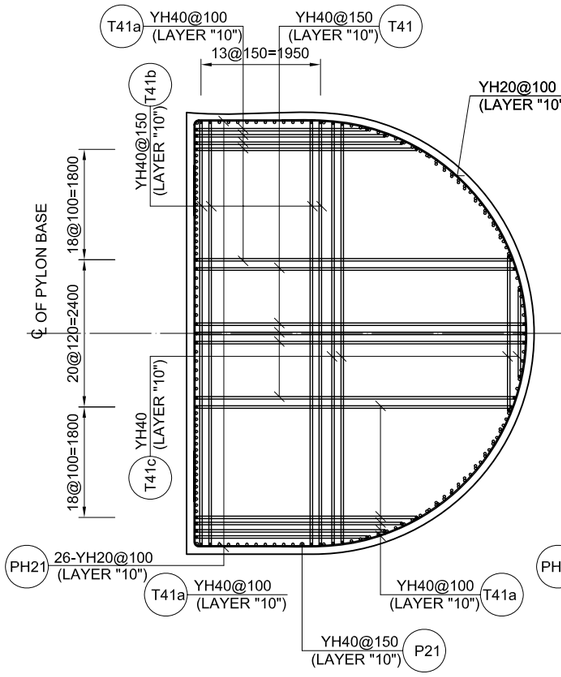
PT-BAR DETAIL
SCALE : 1/5



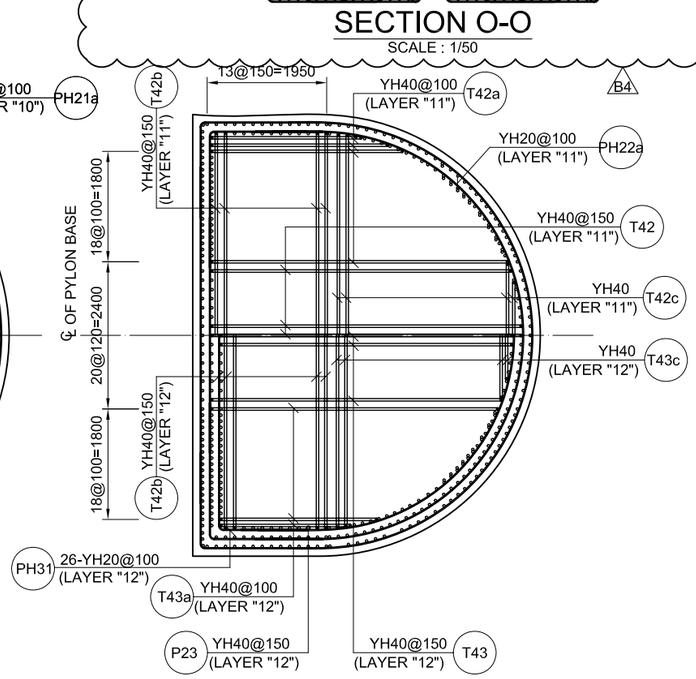
SECTION O-O
SCALE : 1/50



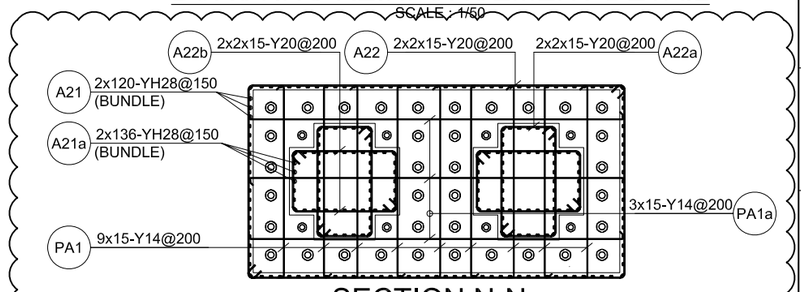
BURSTING REINFORCEMENT DETAIL
SCALE : 1/50



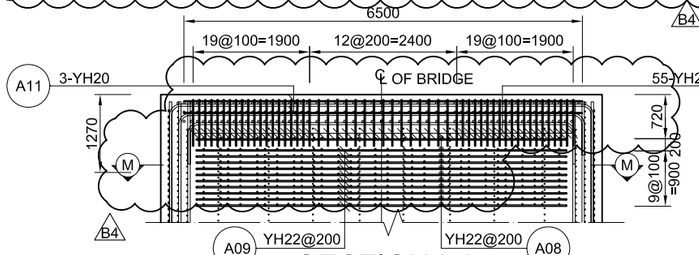
SECTION K-K (LAYER "1")
SCALE : 1/50



SECTION K-K (LAYER "2", "3")
SCALE : 1/50



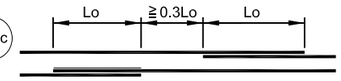
SECTION N-N
SCALE : 1/50



SECTION L-L
SCALE : 1/50

NOTES:

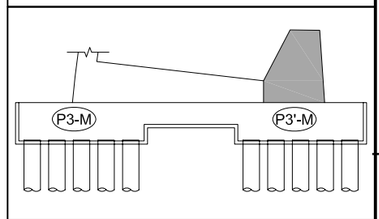
1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
   -PYLON PILE CAP : 40MPa
   -PYLON BASE : 50MPa
3. REINFORCEMENT REBARS SHALL CONFORM TO ASTM A706 GRADE 80(550 MPa) FOR CARBON REBARS(YH).
4. THE STAINLESS STEEL REINFORCEMENT IS RIBBED BARS.
5. MINIMUM CONRETE COVER TO REINFORCEMENT SHALL BE 100mm.
6. FOR SECTION J-J, K-K REFER TO DRAWING NO. RA140-22-BRG-CW-DW-32291.
7. THE LONGITUDINAL DISTANCE BETWEEN TWO ADJACENT LAPS SHOULD NOT BE LESS THAN 0.3Lo(LAP LENGTH)



STAINLESS STEEL REINFORCEMENT SHALL AS A MINIMUM COMPLY WITH THE FOLLOWING.

FOR BAR DIAMETER 6~50MM

HOT ROLLED, STEEL GRADE 1.4362 MINIMUM Rp 0.2=500MPa, ACCORDING TO BS6744 AND DELIVERED WITH A 'CARES' CERTIFICATE CUT AND BEND ACCORDING TO BS8666 WITH A 'CARES' CERTIFICATE (YS).



REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B4	12/02/16	Updated As Shown in Clouds	SWK	HSH	DKK
B3	04/12/15	Updated As Shown in Clouds	SWK	HSH	DKK
B2	12/08/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	17/05/15	First Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (PYLON BASE)
REINFORCEMENT ARRANGEMENT 11/11

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED	17/05/15	17/05/15	17/05/15	17/05/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

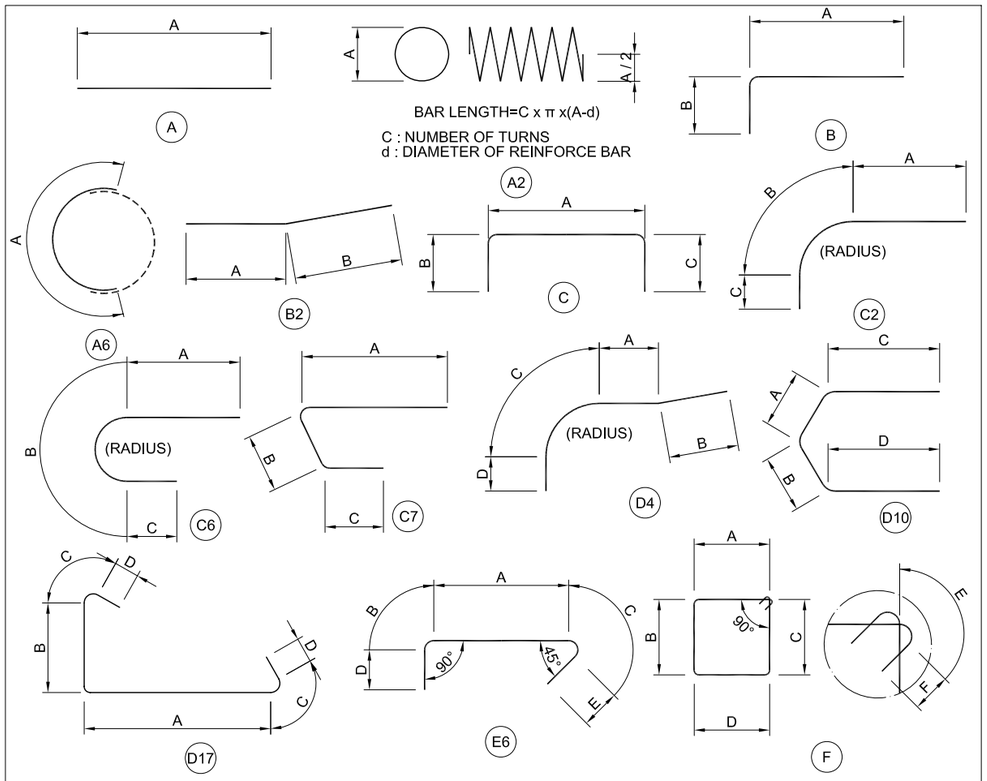
DESIGNER

SYSTRA

DRAWING NO. RA140-22-BRG-CW-DW-32295

REV. B4

A1(594x841mm +2mm)



REINFORCING BAR DATA

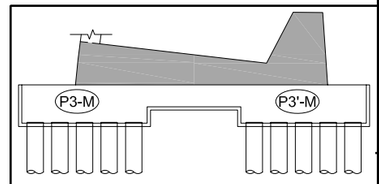
DIAMETER		YH10	YH12	YH14	YH16	YH18	YH20	YH22	YH25	YH28	YH32	YH36	YH40	UNITS
UNIT WEIGHT		0.617	0.888	1.210	1.580	1.994	2.470	2.983	3.850	4.840	6.310	7.991	9.860	kg / m
LAP LENGTH (fy=550Mpa)	TYPICAL	410	495	575	660	740	820	905	1,050	1,345	1,730	2,200	2,720	mm
	TOP BAR	570	685	800	915	1,030	1,140	1,255	1,475	1,850	2,435	3,060	3,800	mm
LAP LENGTH (fy=420Mpa)	TYPICAL	330	400	465	530	595	660	730	850	1,065	1,410	1,765	2,200	mm
	TOP BAR	460	555	645	740	830	920	1,015	1,200	1,515	1,955	2,485	3,040	mm

CALCULATIONS

MARKS	DIA.	SHAPE	NOS	REINFORCING BAR DIMENSION (mm)									LAP SPLICE (mm)		LENGTH (m)	WEIGHT (kg)
				A	B	C	D	E	F	G	H	I	LENGTH	NUMBER		
F01	YH36	A	46	44,385									3,060	4	2,605	20,815
F02	YH36	A	46	44,412									3,060	4	2,606	20,824
F03	YH36	A	46	44,440									3,060	4	2,607	20,835
F04	YH36	A	46	44,467									3,060	4	2,609	20,845
F05	YH36	A	46	44,494									3,060	4	2,610	20,855
F06	YH36	A	46	44,521									3,060	4	2,611	20,865
F07	YH36	A	46	44,549									3,060	4	2,612	20,875
F08	YH36	A	46	44,576									3,060	4	2,614	20,885
F09	YH36	A	46	25,620									3,060	2	1,460	11,667
W05a	YH20	C6	13	820	10,884	820							820	1	173	428
W05b	YH20	A	26	2,785											72	179
W05c	YH20	A	26	9,000											234	578
W05d	YH20	A	26	10,000											260	642
W05e	YH20	A	26	10,000											260	642
W05f	YH20	A	26	10,000											260	642
W05g	YH20	C6	13	820	10,964	820							820	1	175	431
W06a	YH20	C6	13	1,820	10,884	1,820							820	1	199	493
W06b	YH20	A	26	2,785											72	179
W06c	YH20	A	26	9,000											234	578
W06d	YH20	A	26	10,000											260	642
W06e	YH20	A	26	10,000											260	642
W06f	YH20	A	26	8,000											208	514
W06g	YH20	C6	13	1,820	10,964	1,820							820	1	201	495
W07a	YH20	C6	12	820	10,884	820							820	1	160	396
W07b	YH20	A	22	2,397											53	130
W07c	YH20	A	16	9,000											144	356
W07d	YH20	A	8	10,000											80	198
W07e	YH20	A	2	10,000											20	49
W08a	YH20	C6	11	1,820	10,884	1,820							820	1	169	417
W08b	YH20	A	20	2,397											48	118
W08c	YH20	A	14	9,000											126	311
W08d	YH20	A	6	10,000											60	148
W09a	YH20	A	2	1,889											4	9
W09b	YH20	A	6	4,499											27	67
W09c	YH20	A	6	4,813											29	71
W09d	YH20	A	8	5,699											46	113
W09e	YH20	A	8	5,393											43	107
W09f	YH20	A	6	5,588											34	83
W09g	YH20	A	6	5,286											32	78
W09h	YH20	A	2	1,294											3	6
A05	YH20	A	40	37,439									820	3	1,596	3,942
A06	YH20	A	24	15,740									820	1	397	982
A07	YH20	C	202	100	6,896	100									1,433	3,540
T52	YH32	E6	116	6,928	384	2,500	339	192							1,200	7,571
T52'	YH22	C	70	2,500	6,938	2,500									836	2,493
T52d	YH22	A	62	9,565											593	1,769
T52e	YH22	A	78	6,769											528	1,575
T53	YH22	C	763	100	6,894	100									5,413	16,146
FS5	YH22	C	342	3,607	454	4,912									3,069	9,154
FS6	YH22	C	57	3,607	545	4,912									517	1,541
FS7	YH22	C	186	5,100	454	6,405									2,224	6,635
FS7a	YH22	A	186	5,405											1,005	2,999
FS7b	YH22	A	186	6,710											1,248	3,723
FS8	YH22	C	31	5,100	654	6,405							905	1	405	1,208
FS8a	YH22	A	31	5,405											168	500
FS8b	YH22	A	31	6,710											208	620
FS9	YH22	C	234	2,340	454	3,645									1,506	4,494
FS9a	YH22	A	234	5,405											1,265	3,773
FS9b	YH22	A	234	6,710											1,570	4,684
FS10	YH22	C	39	2,340	654	3,645									259	772
FS10a	YH22	A	39	5,405											211	629
FS10b	YH22	A	39	6,710											262	781
T41	YH36	C	15	2,200	5,346	2,200									146	1,168
T41a	YH36	C	44	2,200	4,045	2,200									372	2,969
T41b	YH36	C	14	2,200	6,924	2,200									159	1,267
T41c	YH36	C	22	2,200	4,346	2,200									192	1,538
T42	YH36	C	15	500	5,046	500									91	725
T42a	YH36	C	42	500	3,745	500									199	1,592
T42b	YH36	C	14	500	6,624	500									107	853
T42c	YH36	C	22	500	4,046	500									111	887
T43	YH36	C	15	500	4,746	500									86	689
T43a	YH36	C	40	500	3,445	500									178	1,421
T43b	YH36	C	14	500	6,324	500									103	819
T43c	YH36	C	22	500	3,746	500									104	834

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
   -PYLON PILE CAP : 40MPa
   -PYLON BASE : 50MPa
3. REINFORCEMENT REBARS SHALL CONFORM TO ASTM A706 GRADE 80(550 MPa) FOR CARBON REBARS(YH).
4. THE STAINLESS STEEL REINFORCEMENT IS RIBBED BARS.
5. MINIMUM CONRETE COVER TO REINFORCEMENT SHALL BE 100mm.



REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B2	04/12/15	Updated As Shown In Clouds	SWK	HSH	DKK
B1	12/08/15	Updated As Shown In Clouds	SWK	HSH	DKK
A4	20/07/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	17/05/15	First Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (PYLON BASE)
BAR LIST 1/2

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED				
17/05/15	17/05/15	17/05/15	17/05/15	17/05/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

DESIGNER

SYSTRA

DRAWING NO.

RA140-22-BRG-CW-BS-32296

REV.

B2

QUANTITY TABLE OF REINFORCING BAR 1/2

SCALE : NONE

A1(594x841mm +2mm)

MARKS	DIA.	SHAPE	NOS	REINFORCING BAR DIMENSION (mm)									LAP SPLICE (mm)		LENGTH (m)	WEIGHT (kg)
				A	B	C	D	E	F	G	H	I	LENGTH	NUMBER		
P1	YH40	C2	100	6,475	346	480									730	7,199
P2	YH40	A	98	6,700											657	6,474
P3	YH40	C2	96	6,475	346	480									701	6,911
P1a	YH40	D4	76	6,175	800	346	480								593	5,846
P2a	YH40	B2	74	6,700	800										555	5,472
P3a	YH40	D4	70	6,175	800	346	480								546	5,384
P1b	YH40	C2	62	6,475	346	480									453	4,463
P2b	YH40	A	58	6,700											389	3,832
P3b	YH40	C2	56	6,475	346	480									409	4,031
P11	YH40	A	78	5,330											416	4,099
P12	YH40	A	76	5,330											405	3,994
P13	YH40	A	74	5,330											394	3,889
P11a	YH40	A	76	4,000											304	2,997
P12a	YH40	A	74	4,000											296	2,919
P13a	YH40	A	70	4,000											280	2,761
P11b	YH40	A	18	5,330											96	946
P12b	YH40	A	16	5,330											85	841
P13b	YH40	A	14	5,330											75	736
P11c	YH40	B2	62	3,630	1,916										344	3,390
P12c	YH40	B2	58	3,630	1,916										322	3,172
P13c	YH40	B2	58	3,630	1,916										322	3,172
P21	YH40	A	24	7,510											180	1,777
P22	YH40	A	24	7,510											180	1,777
P23	YH40	A	24	7,510											180	1,777
P21a	YH40	A	76	8,415											640	6,306
P22a	YH40	A	74	8,415											623	6,140
P23a	YH40	A	70	8,415											589	5,808
P21b	YH40	A	48	4,281											205	2,026
P22b	YH40	A	48	4,281											205	2,026
P23b	YH40	A	48	4,281											205	2,026
P21c	YH40	A	62	8,489											526	5,189
P22c	YH40	A	58	8,489											492	4,855
P23c	YH40	A	58	8,489											492	4,855
PH1	YH20	A	16	6,081											97	240
PH2	YH20	A	16	6,231											100	246
PH3	YH20	A	16	5,896											94	233
PH1a	YH20	C6	8	820	5,482	820									57	141
PH2a	YH20	C6	8	1,820	5,246	1,820									71	176
PH3a	YH20	C6	8	820	5,011	820									53	131
PH1b	YH20	C	8	6,980	2,190	2,190									91	224
PH2b	YH20	C	8	6,680	890	890									68	167
PH3b	YH20	C	8	6,380	1,890	1,890									81	201
PH11	YH20	A	52	5,949											309	764
PH12	YH20	A	52	6,099											317	783
PH13	YH20	A	52	5,764											300	740
PH11a	YH20	C6	26	820	5,482	820									185	457
PH12a	YH20	C6	26	1,820	5,246	1,820									231	571
PH13a	YH20	C6	26	820	5,011	820									173	427
PH11b	YH20	C	26	6,980	2,190	2,190									295	730
PH12b	YH20	C	26	6,680	890	890									220	543
PH13b	YH20	C	26	6,380	1,890	1,890									264	652
PH21	YH20	B	186	1,980	1,570										660	1,631
PH22	YH20	B	186	1,592	2,240										713	1,760
PH23	YH20	B	180	1,207	1,270										446	1,101
PH21a	YH20	C6	93	820	5,482	820									662	1,636
PH22a	YH20	C6	93	1,820	5,246	1,820									826	2,041
PH23a	YH20	C6	90	820	5,011	820									599	1,479
PH21b	YH20	A	186	3,701											688	1,700
PH22b	YH20	A	186	3,701											688	1,700
PH23b	YH20	A	180	3,701											666	1,645
PH21c	YH20	A	93	5,480											510	1,259
PH22c	YH20	A	93	3,480											324	799
PH23c	YH20	A	90	5,480											493	1,218
PS1	YH20	C	24	6,910	1,204	890									216	534
PS1a	YH20	C	24	890	1,204	6,910									216	534
PS1b	YH20	C7	8	6,800	1,324	890									72	178
PS1c	YH20	C7	8	890	1,324	6,800									72	178
PS1d	YH20	C	16	890	780	10,716							820	1	211	522
PS1e	YH20	C7	16	10,853	780	890							820	1	213	527
PS1f	YH20	C	16	890	820	9,684									182	450
PS1g	YH20	C7	16	10,346	1,087	890							820	1	210	519
PS2	YH20	C	78	6,910	1,204	890									702	1,735
PS2a	YH20	C	78	890	1,204	6,910									702	1,735
PS2b	YH20	C7	26	6,756	1,324	890									233	576
PS2c	YH20	C7	26	890	1,324	6,756									233	576
PS2d	YH20	C	26	890	780	10,579							820	1	340	839
PS2e	YH20	C7	26	10,706	780	890							820	1	343	847
PS2f	YH20	C	52	890	820	9,684									592	1,463
PS2g	YH20	C7	52	10,214	1,087	890							820	1	677	1,671
PS3	YH20	C	180	6,910	1,204	890									1,621	4,003
PS3a	YH20	C	180	890	1,204	6,910									1,621	4,003
PS3b	YH20	C7	90	6,667	1,324	890									799	1,974
PS3c	YH20	C7	90	890	1,324	6,205									758	1,872
PS3d	YH20	C	180	890	780	7,828									1,710	4,223
PS3e	YH20	C7	180	7,959	780	890									1,733	4,281
PS3f	YH20	C	180	890	820	6,943									1,558	3,847
PS3g	YH20	C7	180	7,600	1,087	890									1,724	4,258
W12	YH40	A	22	12,473									2,720	1	334	3,296
W12a	YH40	A	40	8,628											345	3,403
A08	YH22	C	735	622	4,125	4,125									6,521	19,452
A08a	YH22	C	75	622	1,300	1,300									242	721
A08b	YH22	C	15	622	1,900	1,900									66	198
A08c	YH22	C	45	622	3,500	3,500									343	1,023
A08d	YH22	C	45	622	2,650	2,650									266	795
A09	YH22	C	555	622	6,025	6,025									7,033	20,979
A10	YH20	D10	55	313	313	710	710								113	278
A11	YH20	A	3	6,500											20	48
A21	YH28	C2	240	5,185	222	400									1,394	6,745
A21a	YH28	C2	272	5,185	222	400									1,580	7,645
A23	YH25	B	172	3,050	1,000										697	2,682
A23a	YH25	B	88	3,056	1,000										357	1,374
TOTAL WEIGHT (kg)																544,973
TOTAL WEIGHT (TON)															B4	544.973

MARKS	DIA.	SHAPE	NOS	REINFORCING BAR DIMENSION (mm)									LAP SPLICE (mm)		LENGTH (m)	WEIGHT (kg)
				A	B	C	D	E	F	G	H	I	LENGTH	NUMBER		
A22	Y20	D17	60	6,070	3,070	376	240								585	1,446
A22a	Y20	D17	60	1,720	820	376	240								189	468
A22b	Y20	D17	60	1,620	920	376	240								189	468
A24	Y20	F	12	2,490	2,490	2,490	2,490	376	240						127	313
A24a	Y20	F	24	1,200	2,490	2,490	1,200	376	240						192	474
PA1	Y14	E6	135	3,055	66	99	84	84							457	553
PA1a	Y14	E6	45	6,054	66	99	84	84							287	348
PA2	Y14	E6	24	2,394	66	99	84	84							65	79
TOTAL WEIGHT (kg)																4,149
TOTAL WEIGHT (TON)															B4	4.149

QUANTITY TABLE OF REINFORCING BAR 2/2

SCALE : NONE

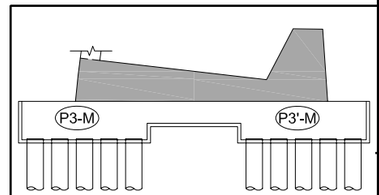
No.	COUNT	REMARKS
YH40	1426	

COUPLER DETAIL

SCALE : NONE

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
   -PYLON PILE CAP : 40MPa
   -PYLON BASE : 50MPa
3. REINFORCEMENT REBARS SHALL CONFORM TO ASTM A706 GRADE 80(550 MPa) FOR CARBON REBARS(YH).
4. THE STAINLESS STEEL REINFORCEMENT IS RIBBED BARS.
5. MINIMUM CONRETE COVER TO REINFORCEMENT SHALL BE 100mm.



REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B4	12/02/16	Updated As Shown In Clouds	SWK	HSH	DKK
B3	04/12/15	Updated As Shown In Clouds	SWK	HSH	DKK
B2	10/09/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	17/05/15	First Issue	SWK	HSH	DKK

EMPLOYER

STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE

SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE

MAIN BRIDGE
PILE CAP OF PYLON (PYLON BASE)
BAR LIST 2/2

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
SWK	SWK	DJB	HSH	DKK
DATE ISSUED	17/05/15	17/05/15	17/05/15	17/05/15

CONTRACTOR

HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

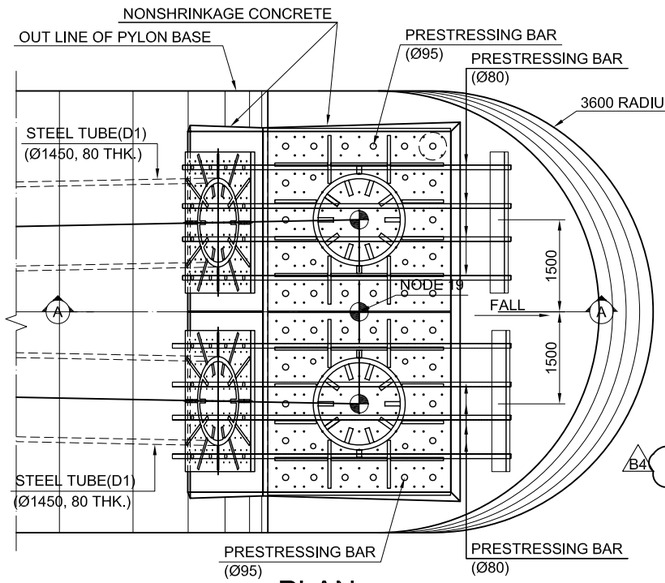
DESIGNER

SYSTRA

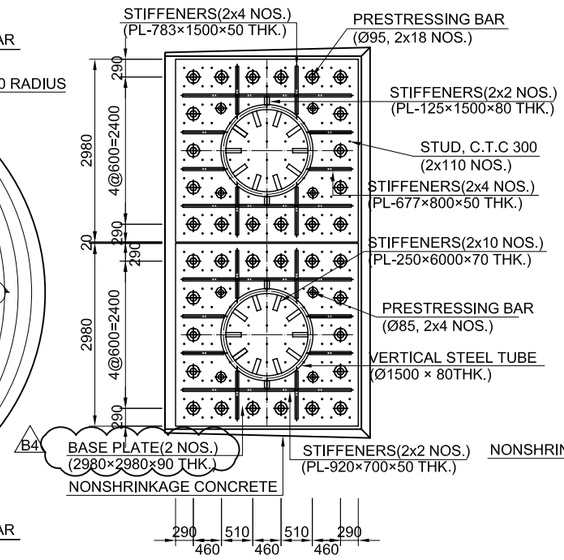
DRAWING NO. RA140-22-BRG-CW-BS-32297

REV. B4

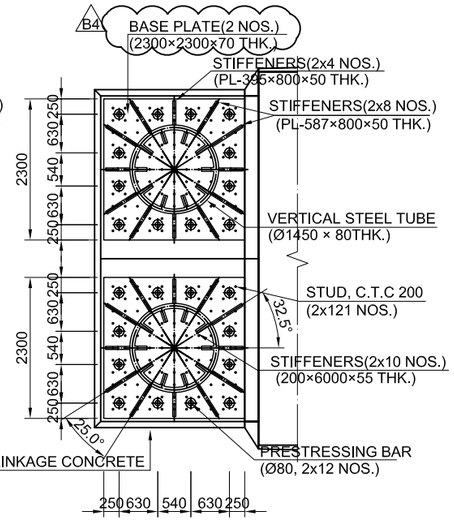
A1(594x841mm +2mm)



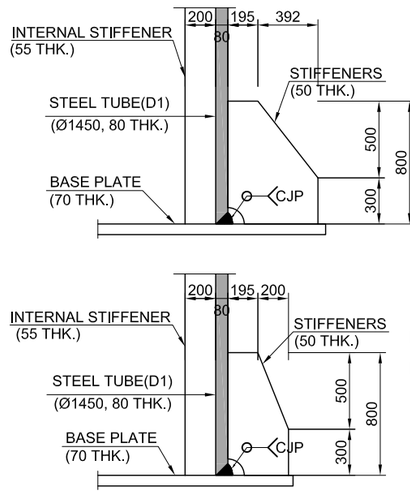
PLAN
SCALE : 1/50



SECTION B-B
SCALE : 1/50



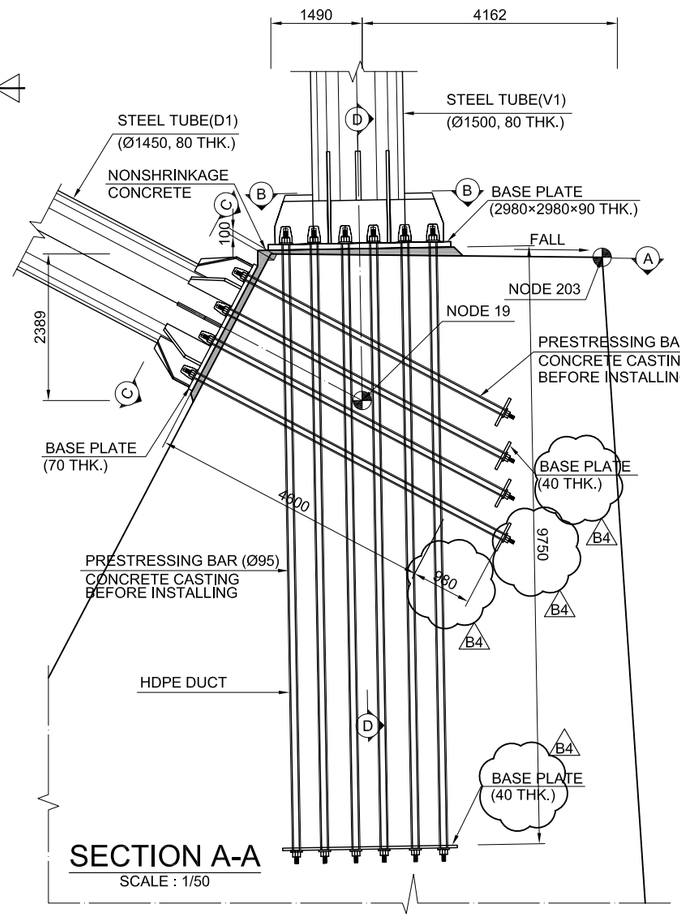
SECTION C-C
SCALE : 1/50



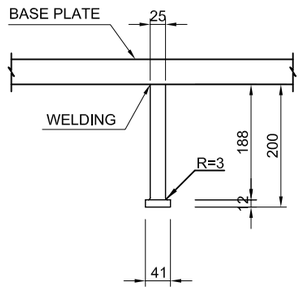
STIFFENER DETAILS (D1)
SCALE : 1/20

NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH(CYLINDER)
   -PYLON PILE CAP : 40MPa
   -PYLON BASE : 50MPa
3. STEEL MATERIALS:
   REBAR IS fy=520MPa
   STUD CONNECTOR IS ASTM A36/A36M (Fy=250MPa)
4. PRESTRESSING BARS: fpu=1200MPa
5. STEEL TUBE:
   V1' ~ V6' AND H1 ~ H3 REQUIRED TO USE Z35,
   V7' ~ V8' AND H4 REQUIRED TO USE Z25.
6. THE SIZE OF HOLE IN BASE PLATE SHALL BE MADE 10MM LARGER THAN THE DIAMETER OF PRESTRESSING BAR FOR PRESTRESSING BAR GOING THROUGH THE PLATE.

B4



SECTION A-A
SCALE : 1/50

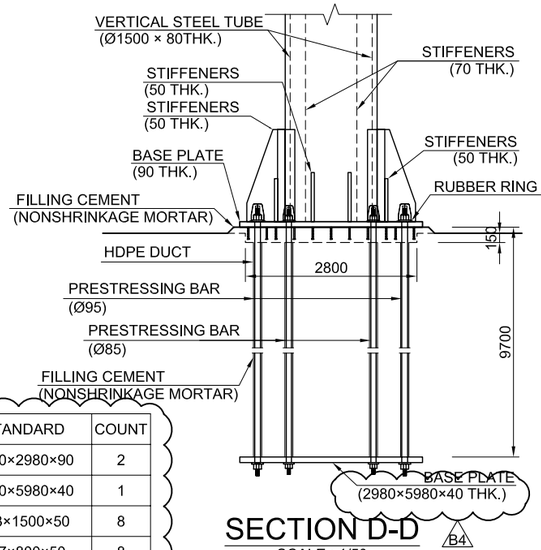


STUD(Φ25) DETAILS
SCALE : 1/5

ID	UNITS	STANDARD	COUNT
V1	BASE PLATE	2980×2980×90	2
	BASE PLATE	2980×5980×40	1
	STIFFENERS	783×1500×50	8
	STIFFENERS	677×800×50	8
	STIFFENERS	920×700×50	4
	STIFFENERS	125×1500×80	4
	STIFFENERS	250×6,000×70	20
	PRESTRESSING BAR	@95	36
	PRESTRESSING BAR	@85	8
	STUD Ø25 L=200	C.T.C 300	220
D1	BASE PLATE	2,300×2,300×70	2
	BASE PLATE	500×2,300×40	4
	BASE PLATE	500×500×40	8
	STIFFENERS	587×800×50	16
	STIFFENERS	395×800×50	8
	STIFFENERS	200×6,000×55	20
	PRESTRESSING BAR	@80	24
	STUD Ø25 L=200	C.T.C 200	242

B4

QUANTITY TABLE OF STEEL
SCALE : NONE



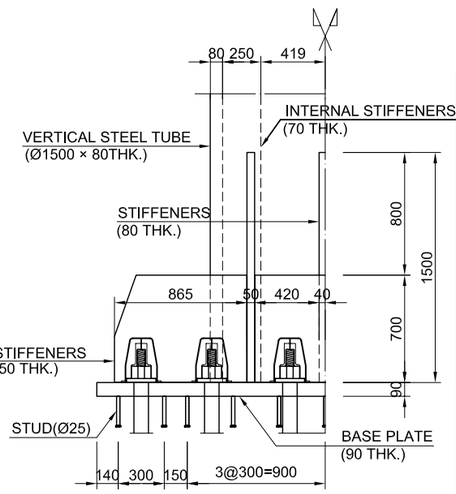
SECTION D-D
SCALE : 1/50

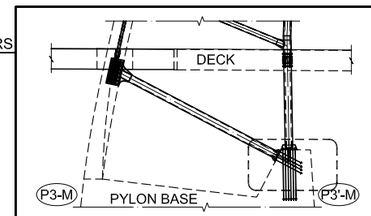
DIAMETER	Pu (kN)	Pjack (kN)
Ø95	8393	5875
Ø85	6709	4696
Ø80	5937	4156

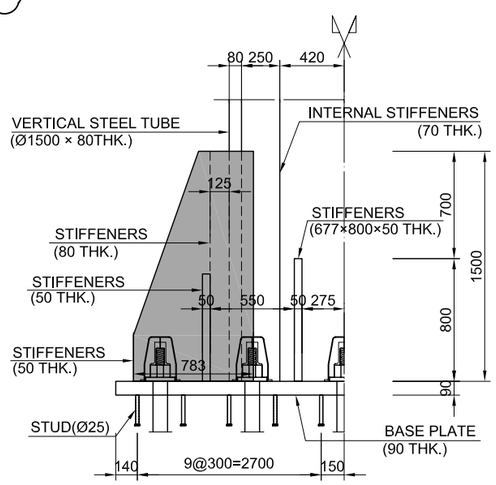
- Pjack = 0.7 x Pu
(Pu : MINIMUM BREAKING LOAD)

JACKING FORCE
SCALE : NONE

B4







STIFFNER DETAILS (V1)
SCALE : 1/20

REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHEC.	APPRO.
B4	12/02/16	Updated As Shown In Clouds	SWK	HSH	DKK
B3	10/09/15	Updated As Shown In Clouds	SWK	HSH	DKK
B2	10/09/15	Updated As Shown In Clouds	SWK	HSH	DKK
A1	17/05/15	First Issue	SWK	HSH	DKK

EMPLOYER
STATE OF KUWAIT
MINISTRY OF PUBLIC WORKS
ROADS ADMINISTRATION

PROJECT TITLE
SHEIKH JABER AL AHMAD AL SABAH CAUSEWAY PROJECT (MAIN LINK)
CONTRACT RA/140

DRAWING TITLE
MAIN BRIDGE
PILE CAP OF PYLON
ANCHORAGE DETAILS

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	SWK	DJB	HSH	DKK
DATE ISSUED				
17/05/15	17/05/15	17/05/15	17/05/15	17/05/15

CONTRACTOR
HYUNDAI ENGINEERING & CONSTRUCTION
Combined Group Contracting Company

DESIGNER
SYSTRA

DRAWING NO.
RA140-22-BRG-CW-DW-32299

REV.
B4

A1(594x841mm +2mm)